IMPACT OF PARENTAL CHOICE EDUCATION SAVINGS ACCOUNTS ON RURAL VIRGINIA COUNTIES

Delivering Value in Education

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Virginia Education Coalition, LLC

VIRGINIA EDUCATION COALITION, LLC
Winning back America's Future ™

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1.0 Introduction

Who we are. Virginia Education Coalition, LLC, (VEC) is an alliance of individuals and organizations that supports parent-led, student-centered education reform. VEC promotes policies and programs that deliver better student educational performance at reduced cost. VEC believes that these objectives are best achieved through parental choice in education; transparent, open dialogue between parents, students, and teachers; and policies and programs that encourage maximum personal freedom and responsibility.

What this paper addresses. This paper estimates the economic and fiscal impact of adopting Parental Choice Education Savings Account (PCESA) legislation in rural Virginia towns, cities, and counties. Specifically, the paper addresses four questions which are asked by Virginia policy makers and legislators:

- Will education choice produce positive economic outcomes, especially in rural Virginia counties?
- Will education choice have a negative fiscal impact on rural Virginia school districts?
- Will education choice cause a mass exodus of students from public education?
- Will education choice negatively impact teacher pay?

These questions are answered both quantitatively and qualitatively by:

- extending the methodology and results of a recent national education econometric impact study to estimate the economic impact of education improvement on Virginia Local School Districts (LSDs) and
- applying the findings of statistically valid "participant effect" school choice studies and a 10-year longitudinal school choice study to rural Virginia LSDs.

2.0 Executive Summary

2.1 The Problem

Virginia's economy faces significant fiscal challenges of increasing older (over-65) and school-age (under-18) populations. A study[1] by Matthew Ladner of EdChoice (formerly The Friedman Foundation) asserts that "[f]aced with rapidly expanding populations of the young and the old, working age taxpayers will experience the growing strain of insufficient tax revenue to fund public services from now [2015] until the foreseeable future." Ladner calculates that between 2010 and 2030, Virginia's over-65

[1] Ladner, M., "Turn and Face the Strain," Friedman Foundation, February 2015. [http://www.excelined.org/facethestrain/]

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and under-18 age population will increase by 85.4% and 23.4%, respectively. Associated public costs will be spread over a smaller working population, increasing Virginia's dependency[2] ratio from 55% to 74%. Assuming no investment and no change in academic improvement, Virginia will have to increase its per-pupil expenditure from $11,523 (2015 dollars) to $16,446 (2030 dollars, assuming average inflation (2006-2015) of 2.4% continues). This represents a budget increase of $ 4.4 billion in 2015 dollars (a 30% real increase above the current K12 budget[3]). Using Ladner's figure of $1,027 per pupil (2015), another $395 million will have to be added to expand physical facilities. ***These significant, increased costs will be borne by taxpayers who disproportionately represent a smaller fraction of the total population.***

Virginia's economic prosperity is in decline. In parallel with burgeoning costs related to elderly and school-aged populations, Virginia's economic competitiveness is in decline. Each year, CNBC ranks the states' economic climates, using more than 60 measures of competitiveness. Since 2009, Virginia has slipped from 1st to 13th place in the overall rankings. Notably, in 2009, Virginia was ranked 7th in economy and 30th in 2016. Similarly in 2009, Virginia was ranked 26th in cost of doing business and 36th in 2016. During this period, North Carolina's overall business rank has moved from 9th (2009) to 5th (2016). ***Clearly, the pressure for Virginia to invest in business growth will increasingly compete over time with its need to meet the growing costs of social safety net programs and education.***

Studies demonstrate that an improvement in the quality of education can greatly improve Virginia's GDP. A recent study by Eric Hanushek, et. al.,[4] estimates that if Virginia were to improve its K12 academic performance over the next ten years to a level that matches Minnesota's National Assessment of Educational Progress (NAEP) performance (2015), Virginia will realize, over a student's lifetime, an additional $811 billion to $1.439 trillion in Gross Domestic Product growth (2015 dollars). Baseline Virginia GDP growth, over the student's lifetime, is estimated to be $2.096 trillion (2015).[5] ***Investment in education can significantly improve Virginia's economic performance; however, academic achievement must be realized at the lowest possible cost to optimize the benefit-to-cost ratio. Implementation of Parental Choice Education Savings Accounts (PCESAs) will reduce overall life-cycle education investment costs by $6.8 billion to $16 billion.***

Numerous statistically valid studies have proven that participant and public school academic achievement is improved and costs are reduced by school choice programs. Eighty-seven studies,[6] performed since 1998, have found that school choice positively impacts student academic outcomes, public school academic performance, cost reduction, racial desegregation, and promotion of civic values and practices. In 2014 and again in 2015, PCESA legislation was introduced in the Virginia General

[2] Dependency ratio is defined as the under-18 population plus over-65 population divided by the 18-to-64 population, expressed as a percentage.
[3] Virginia Deparment of Education Superintendent's Annual Report (2015) [http://www.doe.virginia.gov/statistics_reports/supts_annual_report/2014_15/table15.pdf]
[4] Hanushek, E., Ruhouse, J., Woessmann, L., "It Pays to Improve School Quality," Educational Next, Summer 2016 [http://educationnext.org/pays-improve-school-quality-student-achievement-economic-gain/]
[5] Author's calculation
[6] Forester, G., "A Win-Win Solution: The Empirical Evidence of School Choice," 4ed., The Friedman Foundation for Educational Choice, May 2016. [http://www.edchoice.org/wp-content/uploads/2016/05/2016-5-Win-Win-Solution-WEB.pdf]

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Assembly[7] that would provide Virginia parents with the ability to withdraw their student from public school and receive approximately one-third of the per pupil expenditure in return for assuming responsibility for their child's education using any non-public form of education allowed under current Virginia law. Assuming sales tax, state income tax, and personal property tax rates remain constant and approximately one-third of the per-pupil expenditure is continued to be spent to cover fixed cost of operation, the remaining one-third is saved by the state and locality.[8] Assuming universal choice and 3% to 6%[9] participation by eligible Virginia public school children, ***the 2016 PCESA legislation can potentially save between $145 million and $180 million during its first full-year of operation. School choice demonstrates the potential to increase both academic achievement and reduce cost, which will be necessary if Virginia is to meet its obligations to a growing school age population.***

Virginia parents demand school choice. In a survey of Virginia parents,[10] 35% of parents prefer to send their children to a private school and 9% prefer to homeschool their children. At the time of the survey, only 9% attended private school and 2% were homeschooled. In the same survey, Virginians – independent of political party affiliation – favored the creation of a tax-credit scholarship program by a margin of 65% to 23%. In spite of overwhelming demand, Virginia school choice is essentially non-existent. Choice programs consist of: (1) a nascent, limited (65% Tax Credit) Education Improvement Scholarship Tax Credit (EISTC) program (2012) that provides $3.9 million in scholarships to 1,368 students[11] and (2) nine public charter schools serving 1,399 students, a total of 0.2 percent of public school students.[12] ***Virginia parents' enthusiastic support of school choice provides Virginia legislators with the opportunity to meet parents' educational preferences, increase student and public school academic performance, and reduce educational cost in the face of long-term economic challenges.***

Rural Virginia counties are reluctant to embrace Education Choice even though Education Choice has demonstrated a broad range of positive academic, economic, fiscal, and civic outcomes. In spite of the efficacy of and demand for education choice, rural Virginia county legislators hesitate to embrace choice programs for perceived economic and fiscal reasons, principal among which are their beliefs that: (1) education choice will not produce positive economic outcomes in rural districts; (2) education choice will have negative fiscal impact on rural public education due to funding formulae and the localities' ability to pay; (3) education choice will create a mass exodus of students from the public education system; and (4) education choice will adversely impact teachers and their salaries.

[7] Virginia House Bills HB2238 (2015) [http://lis.virginia.gov/cgi-bin/legp604.exe?151+ful+HB2238] and HB389 (2016) [http://lis.virginia.gov/cgi-bin/legp604.exe?161+ful+HB389]
[8] Author's calculation based upon Virginia Department of Education data sources
[9] Milwaukee's (5.75%), Bexar, TX (6.8%).
[10] DiPerna, "Virginia's Opinion on K-12 Education and School Choice," The Friedman Foundation for Educational Choice, November 2009, [http://files.eric.ed.gov/fulltext/ED508321.pdf]
[11] Alliance for School Choice, School Choice Yearbook, 2016 [http://afcgrowthfund.org/wp-content/uploads/2016/04/2015-16-School-Choice-Yearbook-4_27.pdf]
[12] Virginia Department of Education [http://www.doe.virginia.gov/instruction/charter_schools/charter_schools.shtml]

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2.2 The Solution

This policy paper extends the results of recent education choice macroeconomic research and education choice studies to quantify the economic and fiscal impact of Parental Choice Education Savings Accounts (PCESAs)[13] on Virginia rural counties. Hanushek's study (2016)[14] "It Pays to Improve School Quality" (herein referred to as the Hanushek study) "… document[s] the long-term economic impact of a state's student-achievement levels, which in turn permits [the authors] to calculate the economic returns from school [test score] improvement." The Hanushek methodology and results are extended to project the net present value of Virginia rural county economic value created if Virginia were to improve its current overall NAEP test scores to those of Minnesota, the highest scoring NAEP state at the time of Hanushek study (2015). ***Collective and individual locality economic impact is measured by quantifying the net present value of increased GDP per Capita, Personal Income per Capita, and median Household Income per Capita.***

The Bexar County, TX, Edgewood Independent School District (EISD) Horizon study (Texas Public Policy Foundation)[15] results[16] and four other subsequent studies[17,18,19,20] strongly suggests that rural Virginia local school districts (LSDs) can achieve the necessary academic performance that underlie the economic projections. The probability of success, the rate of success, and cost of success are dependent upon providing students with a broad range of school choice options across all education modes. ***The Horizon EISD study and related study results are also used to qualify the fiscal impact on rural Virginia school districts and teachers.***

Last, demographic and policy differences between Virginia rural localities and EISD are identified, and projected Virginia economic and fiscal outcomes are analyzed based upon the projection's sensitivity to private and public school availability, propensity to homeschool, and other factors. A range of possible outcomes is presented.

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[13] Virginia General Assembly House Bill HB389 [http://lis.virginia.gov/cgi-bin/legp604.exe?161+sum+HB0389]
[14] Op Cit [4]
[15] Aguirre, R., Sanchez, J., Terry, B., "The Horizon Program: A Model for Education Reform – A Report on the 10-Year Horizon School Choice Program in the Edgewood District in San Antonio, Texas," Texas Public Policy Foundation (2008) [http://www.schoolinfosystem.org/pdf/2008/11/2008-09-RR08-Horizon-vouchers.pdf]
[16] Op Cit [1], pg 18
[17] Merrifield, J., Bast, J., "Budget Impact of the Texas Taxpayers' Savings Grant Program," The Heartland Institute E.G. West Institute for Effective Schooling, April 2011 [https://www.heartland.org/publications-resources/publications/budget-impact-of-the-texas-taxpayers-savings-grant-program?source=policybot]
[18] Bast, J., "Making Texas Public Education More Efficient: Taxpayer Savings Grant Program – Testimony by Joseph L. Bast to the Texas Senate Committee on Education," April 2012 [http://www.senate.state.tx.us/75r/senate/commit/c530/handouts12/0824-JosephBast.pdf]
[19] Merrifield, J., Warne, L., Bentsen IV, L., Sullivan, C., Barnett, "Private School Choice: Options for Texas Children," National Center for Policy Analysis, Policy Report 345, February 2013 [http://www.ncpa.org/pub/st345]
[20] Merrifield, J., Gray, N., "School Choice and Development: Evidence from the Edgewood Experiment," Cato Journal, Vo. 33, No. 1, Winter 2013 [http://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2013/1/cj33n1-7.pdf]

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3.0 Summary of Results

Key study findings are summarized in this section. An overview of the methodology is presented in Section 4.0. Background information, a detailed description of the methodology, and detailed pro-forma projections are provided in the Appendices. All dollar amounts are in 2015 dollars. Key findings are:

- Assuming business as usual, the net present value of forecasted increase in Virginia Gross Domestic Product (GDP) over the next 80 years (one life-time) is $2.09 trillion.
- With additional investment of $143 million per year in K12 education, over the next 10 years, Virginia's forecasted net present value of GDP, associated with education improvement, will add $0.881 trillion to $1.439 trillion to base GDP. On average, rural Virginia County Income per Capita is forecasted to grow by between $2,542 (11.7%) and $4,500 (20.7%) per capita and median Household Income by between $6,560 (12.1%) and $11,615 (21.3%). Return on Investment, for the state, is estimated to be between 45.2% (with adoption of Parental Choice Education Savings Accounts (PCESAs)) and 39.4% (without PCESAs).
- Without additional investment in K12 education, the net present value of Virginia's forecasted growth in GDP attributable to the improvement in education will add between $0.683 trillion and $1.104 trillion to base GDP. Virginia rural counties' estimated growth in Income per Capita will be between $1,952 (9.0%) and $3,460 (15.9%) and growth in median Household Income will be between $4,040 (9.3%) and $8,930 (16.8%). Return on Investment, for the state, is estimated to be between 0.2% (with adoption of PCESAs) and -4.8% (without adoption of PCESAs).
- Over the next 10 to 18 years, implementation of PCESA legislation will reduce K12 education cost by between $6.8 billion and $16 billion.
- Under the worst case scenario, sufficient savings are generated by the PCESA legislation to preclude negative fiscal impact on rural local school districts. The state and localities will save between $145 million and $180 million in the first full year of PCESA implementation.
- Academic improvement in NAEP 8th Grade Math scores is estimated to be 25%.
- During the first full-year, it is estimated that between 3.5% and 4.06% of eligible students will take advantage of the PCESA. Impact on teachers will be minimized by locality and state savings which will be available for reinvestment in those students who remain in the public school system as well as in teacher salaries.
- All projected estimates are consistent with academic, economic, and fiscal results reported by two actual education choice programs: the Bexar, Texas, Edgewood Independent School District (EISD) Horizon Program (1998-2008) (Appendix B) and the Milwaukee Parental Choice Program (1990 – present) (Appendix C), both of which have been the subject of longitudinal studies. In the case of the 10-year Horizon program, math scores increased 28%, public school teachers' pay increased 37%, and property values increased by 114%.
- Economic and fiscal impact results for the state are presented in Appendices D and E, respectively.

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4.0 Methodology

This paper addresses four principal concerns expressed by Virginia policy makers and legislators: (1) will education choice produce positive economic outcomes in rural districts; (2) will education choice have negative fiscal impact on rural public education; (3) will education choice create a mass exodus of students from the public education system; and (4) will education choice adversely impact teachers and their salaries? The answer to these questions is dependent upon the answer to two other questions. First, does education choice produce positive participant and public school academic outcomes? Second, does academic improvement lead to increased economic performance and can it be quantified? If the answer is "no" to either of these questions, then further investigation is unnecessary.

4.1 Assessment of Education Choice Impact on Academic Outcomes

The impact of education choice on the academic performance of individual participants and public schools from which they are drawn is a hotly debated, political issue, with ardent supporters and opponents, on both sides.

It is not the intent of this paper to argue this point. Instead, the reader is referred to Forester's work[21] that analyzes all the empirical research on private school choice programs over the period 1998-2015. Eighty-seven out of 100 studies examining parental choice in education have shown school choice to have an overwhelming positive impact on improved student academic outcomes, improved public school academic performance, reduced cost to taxpayers, racial desegregation in schools, and improved civic values and practices. Ten have reported no visible effect. Three have reported a negative effect.

For "academic outcomes of choice participants" (viz., student academic outcomes), the studies, selected by Forester[22] for inclusion in the report, examined only school choice programs where randomly-selected students were assigned to either a "treatment group" or to a "non-treatment" (control) group. Because the two groups were segregated only by a random lottery, they were likely to be similar in every respect, other than the treatment they received: either attendance at private school, charter school, or a public school of their choice.

Statistically rigorous, peer reviewed empirical research overwhelming proves School Choice delivers better student, school, taxpayer, social outcomes.

Statistically-sound studies eliminate the bias created by typical studies that compare existing public school to private school academic performance, using populations in which participants self-select based on participant socio-economic factors – such as ability to pay, educational mode preference, matters of conscience, or

[21] Op Cit [6]
[22] Op Cit [6]

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public school assignment by zip code. A frequently quoted self-selection study, by Lubienski and Lubienski (2006),[23] finds that even though private school 2003 Math 8th Grade NAEP raw scores are 5.4 to 21.2 points higher than public schools that, after controlling for "measures of socioeconomic status, race/ethnicity, gender, disability, limited English proficiency, and school location," public schools perform as well if not better than private schools. Other studies assert that the Lubienskis' research study design is flawed, and discount their findings.[24]

To fairly evaluate the effect of school choice in the present study, Best Case and Worst Case economic and fiscal impact are reported under Best Case and Worst Case conditions:

- The difference between private / homeschool and public school NAEP 8th grade math scores is 6 points, which is approximately one-half of the Lubienskis' reported average (viz., 13.3) and the 2015 NAEP 8th grade math score for Catholic schools (the only reported data for private schools) (viz., 12) (Best Case)
- No difference exists between private / homeschool and public school NAEP 8th grade math scores (Worst Case)

Two studies are referenced in this report and used as baselines for comparison. The first is the Bexar, TX, Edgewood Independent School District (EISD) 10-year longitudinal study of school choice —a self-selection type program, described in more detail below – in which students within the district could choose, without cost, any public or private school in the district. The second is the Milwaukee Parental Choice Program (MPCP) 5-year longitudinal study, in which participants were randomly selected to participate in a program that provided them with a scholarship to attend private school.

4.2 Assessment of the Impact of Education Improvement on State Economics

The Hanushek study investigates the effect education improvement has on a state's economic benefit. Hanushek finds that a strong correlation and causality exists between NAEP 8th Grade Math test scores and growth of GDP per Capita over the period 1970-2010 (See Exhibit 1). For all states, Hanushek calculates the net present value of the potential gain in states' GDP attributable to improved student performance under four scenarios: (1) bringing every state up to the best state in the United States (Minnesota) ($76 trillion) (2) bringing every state up to its best in the region ($36 trillion); (3) bringing all students in each state up to the NAEP basic achievement level ($32 trillion); and (4) each state achieving the U.S. best on its own ($46 trillion). For Virginia, Hanushek calculates that Virginia could realize (in 2015 dollars) a net GDP benefit attributable to education improvement of $1,439 billion under scenario

[23] Lubienski, C., Lubienski, S., "Charter, Private, Public Schools, and Academic Achievement: new Evidence from NAEP Mathematics Data," National Center for the Privatization in Education (Columbia University), January 2006 [http://199.223.128.57/assets/docs/HE/mf_OP111.pdf]

[24] Wolf, P., "Comparing Public to Private – Lubienskis' conclusions rely on flawed research design,", Education Next (Summer 2014) [http://educationnext.org/comparing-public-schools-private/]

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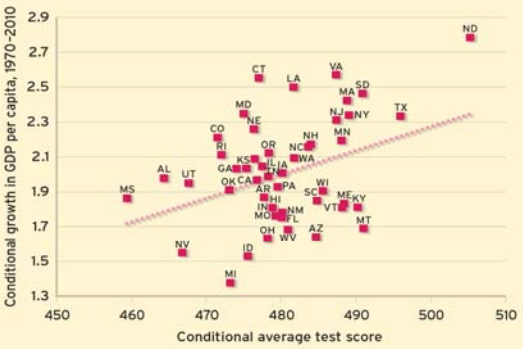
(1) or $811 billion under scenario (4).[25] These two Hanushek scenarios are used as the basis for this paper's Best Case and Worst Case scenarios, respectively.

Exhibit 1 – GDP Per Capita vs. Average NAEP Test Score

Strong Relationship between Test Scores and Economic Growth (Figure 4)

States like Alabama, Mississippi, and Nevada have suffered from both low levels of math achievement and disappointing rates of economic growth, while states like North Dakota, South Dakota, and Texas have enjoyed significantly higher student achievement and rates of economic growth. The upward slope of the line showing the relationship between the two factors suggests that a state's economic future is directly related to the achievement component of its knowledge capital.



NOTE: The regression line displays the relationship between the average annual rate of growth of real GDP per capita in 1970-2010, conditional on the initial level of real GDP per capita in 1970, average 8th-grade mathematics test scores (adjusted for interstate migrants by education and for international migrants by the 90th percentile in country of birth, using state population shares in 1970), average years of schooling in 1970, and real physical capital per worker in 1970.

SOURCE: Authors' calculations

*Hanushek, Footnote 4

Hanushek's results were derived by first estimating the expected growth rate of a state's economy if the current skill level of workers was to remain unchanged. This baseline growth path was compared to one that included the effect of better academic performance. GDP gains were calculated for each state and then discounted at 3% per year to a present value (2015). The gain calculation assumed an 80-year (viz., one lifetime) period to attain under the following assumptions: (1) education reform takes 10 years to be fully effective; (2) the labor force improves only as new, more skilled students replace less-skilled workers (assumed to take 40 years, with 2.5% of the workforce being replaced each year); (3) gains are evaluated over the life-span of a person (80 years).

In this paper, two possible outcomes are analyzed utilizing this methodology: (1) no extraordinary additional investment in the current system (e.g., business as usual, Worst Case) and (2) additional investment in the public school system, over the next 10 years, to bring Virginia to academic parity with Minnesota (Best Case).

Currently, Virginia spends $11,523 per pupil (2015). An analysis of Virginia per-pupil expenditures (in 2015 dollars) over the period 1990-2015 versus NAEP 8th grade math scores is shown in Exhibit 2. An examination of the underlying data suggests strong correlation between 1990 and 2005. After 2007, NAEP test scores and per pupil spending flatten and diverge. Overall, a correlation exists between the full range of data (R^2= 0.7609, α = 0.05, P = 0.00022). Some analysts suggest that this divergence is likely attributable to the introduction of Common Core State Standards. A 2015 analysis by the Brookings Institution[26] suggests that this is not causal and something else is at work that is more fundamental.

[25] Hanusek, E., et al, "Virginia: Economic Future with Educational Reform," Education Next, [http://educationnext.org/files/ednext_XVI_3_hanushek_virginia_projections.pdf]

[26] Loveless, T. "Why Did NAEP Scores Drop?," Brookings Institution, October 2015, [https://www.brookings.edu/research/why-did-naep-scores-drop/]

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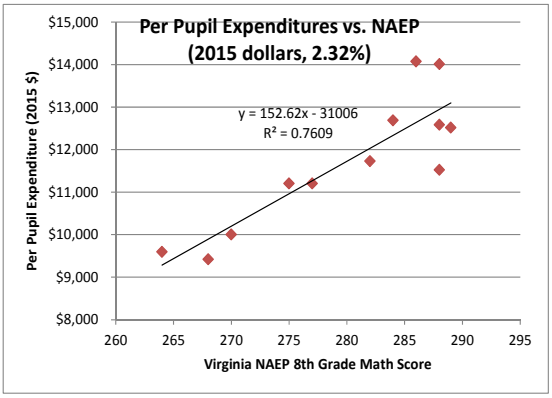
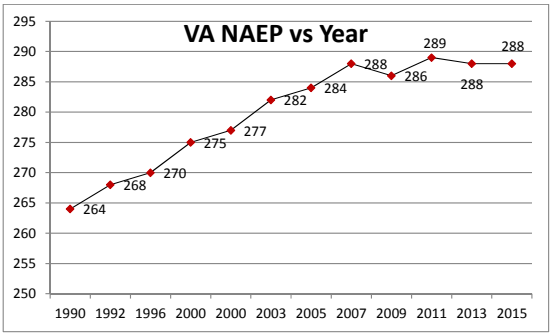
In spite of this qualification, the data in Exhibit 2 are the best available data and were used to estimate the Virginia per-pupil expenditure (2015 dollars) required to achieve a NAEP 8th Grade Math Score of 294 (Minnesota) to be $13,894 ± $432 (90% Confidence Interval), in 2015 dollars. Virginia FY2014-2015 (March 2015) actual enrollment was 1.274 million students, and projected to grow at approximately 1.8% per year over the period 2015 to 2030[27]. ***This implies that Virginia's 2015 K12 budget should have been between $2.5- and $3.6-billion dollars ($3.05 billion, on average) greater than it actually was, at that point in time, for its academic performance to have equaled Minnesota's.*** In 2015 dollars, the difference between Virginia and Minnesota's NAEP scores is 5.82 points; therefore, the 2015 value per NAEP point is $0.524 billion.

Exhibit 2 – Virginia Per Pupil Expenditures (PPE) vs. NAEP Score





Using the 2015 value per NAEP point, Hanushek's performance model, and existing Virginia and Minnesota NAEP performance trend lines based on past historical performance, the point in time that the trend lines will intersect is calculated: (1) without investment or (2) with investment in equal installments over a 10-year period that causes the trend lines to intersect in year 10.

Exhibit 3 illustrates the NAEP performance trend lines: (a) without investment and (b) with a Virginia investment of $143 million per year for 10 years. Both graphs result in Virginia achieving academic parity with Minnesota.

If Virginia invests and achieves parity with Minnesota in 10 years, Hanushek projects that Best Case (all states bring their state up to Minnesota's performance), Virginia will realize future annual GDP increases, over a lifespan (80-years) valued at $1.439 trillion in 2015 dollars.

Hanushek also calculates economic value added if Virginia raises its performance to that of Minnesota's, while other states make no gains at all. Hanushek estimates Virginia will realize $0.811 trillion in 2015 dollars (Worst Case).

[27] Op Cit [1]

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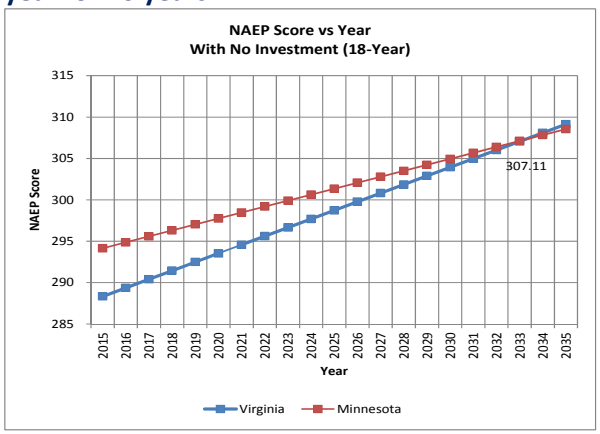
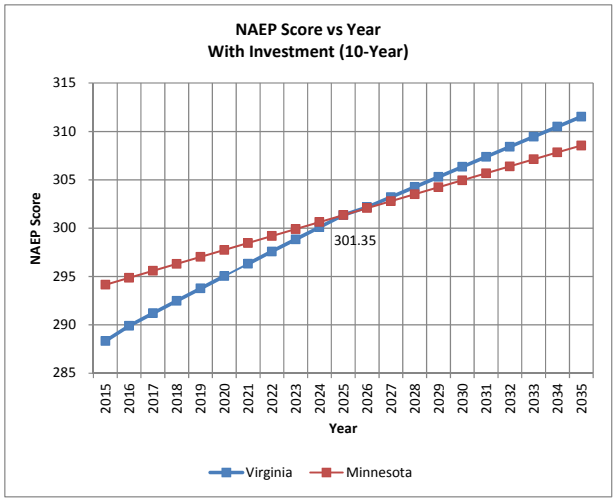
To properly value these two cases and take into consideration the timing of cash flow, it was assumed that the economic value added accrued uniformly over an 80-year period at an assumed discount rate of 3%. With investment, Hanushek's Best Case and Worst Case scenarios are: $1,439 trillion ($47.6 billion per year) and $0.811trillion ($26.85 billion per year), respectively.

If no investment is made, the states' natural spending trajectory results in Virginia reaching parity with Minnesota in 2033 (18 years). In this case, Hanushek's Best and Worst Case scenarios must be adjusted for the 8 year delay. Using appropriate discounted cash flow techniques, Best and Worst Case Economic Value Added (EVAs) are calculated to be $1.104 trillion ($32.2 billion per year) and $0.623 trillion ($20.6 billion per year).

Economic impact results are summarized in Section 5.0. Economic impact by locality is reported in Appendix D.

Exhibit 3 - VA and MN academic parity with (a) no investment and with (b) a $143M investment per year for 10 years





4.3 Assessment of the Fiscal Impact of Education Improvement on Rural Localities

Hanushek's study asserts that educational improvement leads to long-term, increased growth in state GDP. However, it does not provide insight into how the educational improvement is efficiently and cost-effectively achieved and what the fiscal impact will be on state and local government.

To address this question, the state and local fiscal impact of implementing the two economic scenarios in Section 4.2 is estimated under two options: (1) business as usual and (2) implementation of Virginia's proposed PCESA (2016 Virginia General Assembly bill HB389[28]). First-year state and LSD PCESA fiscal impact is quantified, and then ratios of critical first-year model parameters are used to scale model results over the next 10 and 18 years. The discounted Return on Investment of the two economic

[28] Op Cit [7]

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scenarios (both Best Case and Worst Case, with and without PCESA) is calculated and the results compared.

The paper compares the model's projected results to the results produced by two actual school choice programs: (1) the Bexar, TX, Edgewood Independent School District (EISD) Horizon program and (2) the Milwaukee Parental Choice Program (MPCP).

While the target population demographics between EISD, MPCP, and rural Virginia LSDs are significantly different and each program's scope is different, they do offer the following advantages as benchmarks:

- The EISD Horizon Program was a 10-year longitudinal study funded by an outside organization in which parents were allowed to self-select their student's education mode, including private school (10% of participants) or any public school (90% of participants) within the public school district. Like the PCESA, the only participation criterion was that the child be a resident of the EISD and attending a public school. Unlike Virginia's PCESA, which is funded through a reduction of the state aid per pupil, the EISD program was funded by a consortium of external private non-profit organizations. External funding of scholarships mitigated financial exigencies created by a parent's inability to pay private tuition or disparities in public school funding formulae. The scholarships effectively eliminated "tuition" both as a decision criterion in parents' choice and in the school's provision of the service.[29] Scholarship amounts varied, based on education mode, but averaged approximately 60% for grades PK-8 and 66% of per pupil expenditure for grades 9-12.

  The program has been the subject of a number of well-documented studies,[30] which examined performance data over its 10-year history. In comparison, Virginia's PCESA allows a parent of any public-school child, who is a Virginia resident and physically residing in Virginia, to choose any mode of legally allowable non-public education, including homeschooling (which the Horizon program did not). Unlike EISD, the PCESA student's only public school choice is the school to which they are assigned, based on their zip code.

- The MPCP, in which participants are subject to random selection, is the United States' first school choice program, started in 1990, and is ongoing. In 2010 -2011 the program went through a transition. It expanded its scope, relaxed student participation criteria, and placed additional compliance criteria on participating private schools. When it first started, low-income participants (≤ 175% of federal poverty guidelines) were provided vouchers – equal to the average state aid per pupil (approximately 45%) – to attend only secular private schools and were financed by an equivalent reduction of state aid to the district. Like Virginia's program, which is valued at approximately 30% of total per pupil funding, the PCESA's funding results in a public school system revenue loss.

[29] Note: Parents were responsible for transportation and reimbursement was lower for private schools outside of the EISD.
[30] Op Cit [4, 15, 17, 18, 19, 20]

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Subsequent to a Wisconsin Supreme Court ruling in 1998, religious private schools were allowed to participate, and enrollment increased dramatically. Both secular and non-secular private schools are allowed to participate in the Virginia PCESA.

Through grants, the MPCP commissioned 31 independent, individual studies of the program over the period 2006-2011 to quantify the effects of school choice in Milwaukee. The results of these studies are summarized in the program's final annual program summary, Report 36,[31] and provide insight into the effect of school choice over a long period of time.

A summary of results is presented in Section 5.0. Appendix A provides additional information about calculation methods used in this paper. Appendix B and C describe the detailed features, functions, and benefits of the Horizon and MPCP programs. Reference is made to these program details, where appropriate, throughout the remainder of this paper. Economic and fiscal impact results, by locality, are presented in Appendices D and E.

This paper's economic and fiscal impact projections are generated through three models: (1) the PCESA Model; (2) the Supply / Demand Model; and (3) Fiscal Impact Model. The models are summarized below. Detailed methodologies underlying these models are described in Appendix A. Critical assumptions are:

- School year 2014-2015 data and calendar year 2014 census data are used, with no adjustments for timing differences.
- Impact is measured assuming implementation starting in academic year 2016-2017, to maintain consistency with the Hanushek estimate of GDP growth through calendar year 2015.
- Participant eligibility and financial provisions are consistent with Virginia House Bill (HB) 389, 2016, as originally introduced.[32]
- Budgeted average daily membership (ADM) and per pupil expenditures (PPE) by local, state, and federal government are as specified in the Virginia Department of Education (VDOE) 2014-2015 Superintendent's Annual Report ("Report"), Tables 14A and 15,[33] and are the basis for all forecasts. LSD PCESA funding is based only upon Report Table 14A columns entitled "Sales Tax" and "Basic Aid." Report Table 14A moneys not used by the PCESA (~ 20%) are available as additional per pupil savings to the state because the PCESA student is counted in ADM but cannot receive allocations from these restricted-use sources.
- Report Table 13[34] (Disbursements by Division) is used to calculate fixed and variable costs of operation by LSD. Variable costs are defined as those costs identified in Report Table 13 labeled

[31] Wolf, P., "The Comprehensive Longitudinal Evaluation of the Milwaukee Parental Choice Program: Summary of Final Reports," University of Arkansas, Feburary 2012. [http://www.uaedreform.org/downloads/2012/02/report-36-the-comprehensive-longitudinal-evaluation-of-the-milwaukee-parental-choice-program.pdf]
[32] Op Cit [7]
[33] VDOE Superintendent's Annual Report (2014-2015) [http://www.doe.virginia.gov/statistics_reports/supts_annual_report/2014_15/index.shtml]
[34] Op Cit [33]

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"Instruction." Instruction costs are divided by "Per-Pupil Expenditure for Operation Regular Day School" to derive the percentage of an LSD's variable cost of operation. All other costs in Report Table 13 are considered fixed.

- Per pupil federal funding is not touched by the PCESA, is assumed to be a fixed cost, and is passed through to the locality for disbursement.
- State and local sales taxes, income taxes, and property tax rates across the Commonwealth are not changed by this legislation. Therefore, when a student is removed from the school system, the sources of funding for him or her are not altered.

4.3.1 The PCESA Model

The PCESA model is constructed in a manner that ensures that PCESA funding uses only general appropriations money from variable cost sources (viz., the cost follows the student). This ensures that all fixed costs are covered. In other words, **when a student leaves the public school, a portion of the variable cost follows him, fixed costs remain to cover school operations even though the student is not present, and remaining variable costs are allocated between the state and the locality as savings.**

Expected results for the "average" LSD are illustrated in Exhibit 7.

Exhibit 4 - Pro Forma for Average Local School District

Average LSD Proforma	
LSD Fixed Cost	$3,572
LSD Savings	$2,377
Federal Funding	$772
PCESA	$3,175
State 10% Adm.	$353
Addl State Savings	$1,275
Average PPE	**$11,523**

PCESA Model details are provided in Appendix A.

4.3.2 The Supply / Demand Model

The PCESA Model projects the PCESA's legislation's cost and savings, on a per pupil basis, for each LSD. The Supply / Demand Model projects the number of participants in the PCESA program, by LSD, assuming an eligible participant chooses one of three scenarios: (1) remain in public school; (2) elect to attend private school; or (3) elect to homeschool (e.g., no distinction is made between traditional homeschool and virtual school).

The number of participants, under these three scenarios, depends on several factors.

1. The value of the PCESA (previously calculated in the PCESA model).
2. The propensity of a parent to choose private school or homeschool.
3. The cost and availability of private school and the cost to homeschool.

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4. Whether private schools will increase tuition in response to the program.
5. Whether parents with children already in private school will move them to public schools for a year to qualify for savings accounts in later years.

As modeled, initial demand in the first year is projected to be approximately 4.06% of total public school average daily membership. Of the 4.06%, 3.45% are private school students and 0.61% are homeschool students. These numbers are less than EISD and MPCP in the first year (5.8% and 5.75%, respectively) and in the second year (6.8% and 7.62%, respectively), principally because the value of the PCESA relative to total PPE (~ 30% of the total) is less than EISD (66%) or MPCP (45%). Even with a higher scholarship value, experience in these states demonstrates that private schools can increase capacity quickly, certainly within the first two years of the implementation of any program. Neither MPCP nor EISD saw significant increases in private school tuition following adoption of scholarship programs.[35]

Supply / Demand model details are provided in Appendix A.

4.3.3 The Fiscal Impact Model

The Fiscal Impact Model takes the results of the PCESA Model and Supply / Demand Model, reconciles them, and allocates to the parent, the locality, and the state costs and savings.

See Appendix E for PCESA fiscal impact results by locality and for the state for the first year of operation. These results are reported for two cases: (1) the base case, which assumes no transfer of private school students to public school in order to qualify for the PCESA in the second year and (2) a Monte Carlo simulation of the Fiscal Impact Model. The Monte Carol simulation uses a private-to-public transfer rate distribution that is triangular: the most optimistic case is 0% (base case), most likely case is 3.66% (first-year assumed enrollment rate in overall life-cycle model, See Section 4.3.5), and the most pessimistic case is 4.06% (projected first-year private school and homeschool enrollment rate).

4.3.4 Return on Investment

The results of the Economic Model (Section 4.2) and first-year Fiscal Impact Model (Section 4.3.3) are combined to estimate the Return on Investment of various options over their life-cycle. Options include:

1. Hanushek Best Case and Worst Case, without investment (18 year period of performance).
    a. Without PCESA
    b. With PCESA
2. Hanushek Best Case and Worst Case, with 10-year Annual Investment (10 year period of performance)
    a. Without PCESA
    b. With PCESA

[35] Op Cit [17], pg 12

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The following assumptions are made:

- The PCESA program's participant growth profile (homeschool and private school combined) approximates the growth pattern that was demonstrated by the EISD, on a percentage enrollment basis, by year. The growth pattern is 3.66% of public school ADM in the first year and 15.4% of ADM in the 10th year. First year participation is less than the Enrollment Model's first-year projected 4.06% ADM. The 10th year ADM is less than one-third of DiPerna's[36] long-term, parent-preference survey projection of 44% combined private school and homeschool education modes. These assumptions recognize that growth will probably be uneven in the first year and second year, during the initial roll-out. Also, the PCESA scholarship, as fraction of total PPE, is lower that the EISD and MPCP programs, and a significantly lower percentage of private school tuition will be covered by the PCESA. This makes Virginia's private school PCESA option less attractive. On the other hand, the EISD and MPCP enrollment rates did not reflect homeschooling. This mitigates the private school tuition effect somewhat.

- The savings generated by the PCESA remain relatively constant as a percentage of per pupil expenditure (PPE) over time (viz., LSD average savings is 20.3% of PPE and state savings is 14.1% of PPE for each student who receives a PCESA). Significant reallocation of funding by funding distribution category (Table 14A of Superintendent's 2015 Annual Report) could significantly impact the result of the calculation.

- Annual public school growth is linear and grows from its present value (1.247 million, end of AY2014- 2015, beginning of AY2015-2016) to that predicted by Ladner (1.659 million, 2030).[37] Under this assumption, the 2025 projected average daily membership is 1.519 million.

- The academic value of private or homeschool education relative to public school education is hotly debated. If private school and homeschool education do deliver academic improvement, as some suggest, then enrollment in these programs will create additional economic value for the communities in which these students live. Proponents of public school education postulate that, when controlled for specific demographic variables and non-academic programs, public school performance on NAEP tests are as good in reading as and slightly better in math than their private school or homeschool counterparts.[38] Private school and homeschool proponents point to national NAEP scores[39] that suggest private school students score 12 points higher (296) than public school students (284) on the 8th grade mathematics and are attributable to factors different than those identified by opponents.[40,41] With these considerations in mind, two Cases are run for each option to assess the economic effect created by additional private school / homeschool students who potentially may contribute disproportionately to increased academic

[36] Op Cit [10]
[37] Op Cit [1]
[38] Peterson, P., Llaudet, E., "The NCES Private-Public School Study – Findings are other than they seem," Education Next, Winter 2007
[39] NAEP national (public and private) and state average scale scores for mathematics, grade 8, by all students (total), year and jurisdiction, 2013. Differences between national and state scores may vary.
[40] Wolf, P., "Comparing Public to Private Schools," Education Next (Summer 2014).
[41] Op Cit [38]

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performance. Case 1 is assumed in reporting Best Case economic and fiscal impact results. Case 2 is assumed in reporting Worst Case economic and fiscal impact results.

- Case 1 assumes a 6-point academic difference exists between public school, private school, or homeschool students on NAEP in mathematics. In this case, it is assumed that public schools are funded over a 10-year period, as described in Scenario 1 in order to raise NAEP academic achievement from a score of Virginia's (~288) to Minnesota's score (~294). In Case 1, Virginia meets Hanushek's economic predictions by raising the necessary public school per pupil spending required to achieve a NAEP score of 294 within 10 years. Districts, currently scoring at or above an SOL score equivalent to a NAEP 294 score, are assumed to maintain this score and do not contribute to Gap Closure. These districts receive no additional economic benefit beyond that which they would create in the business as usual model. Gap Closure is accomplished by improving the performance of under-performing LSDs by a fixed percentage across all under-performing Districts and economic impact is allocated upon their relative contribution to Gap Closure.

  Increased academic performance of all PCESA students, across all LSDs, does have economic impact on the LSDs in which they reside and fiscal impact through cost savings they deliver to the locality and state.

- Case 2 assumes that no academic difference exists between PCESA students and public school students. In this case PCESA students do not have additional economic impact but do have fiscal impact.

5.0 Results and Discussion of Results

5.1 Education Improvement Leads to Increased Economic Performance

5.1.1 Return on Investment

The model was run for two basic economic value added Hanushek scenarios: (1) Virginia closes the NAEP gap with Minnesota, over a 10-year period, as part of broader national initiative in which all states try to improve their performance (Best Case) or (2) Virginia closes the NAEP gap without investment and other states make no gains at all (Worst Case). Hanushek's projections assume that Minnesota's performance remains constant (no further improvement) and Virginia's improvement gain is based solely on additional per pupil spending to close the gap between the two states. In fact, an examination of both Virginia and Minnesota's NAEP performance over time suggests that, without additional investment, Virginia's NAEP performance will equal Minnesota's by 2033 (Exhibit 3). Therefore, the Worst Case Scenario modifies Hanushek's Worst Case economic value added from $0.811 trillion to $0.623 trillion and Best Case economic value added from $1.439 trillion to $1.1.04 trillion to reflect the reduced value of the economic value added by delaying parity by 8 additional years if no additional investment is made.

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Exhibits 5 and 6 illustrate the Return on Investment of the two scenarios. Exhibit 5 assumes business as usual and Exhibit 6 assumes additional investment in the Virginia school system.

In these calculations, all numbers are expressed in 2015 dollars. "Benefit" is the cumulative economic value added over either 10 years or 18 years (Best Case and Worst Case, respectively) and "Cost" is cumulative LSD and State Costs over the appropriate period. Return on Investment is shown without the PCESA and with the PCESA. The presence or absence of the PCESA does not change the benefit stream, unless it is assumed that private school or homeschool students provide an academic advantage that accelerates the test score gap closure over the period (viz., closes the gap sooner). However, the PCESA does reduce the cost because it provides savings to both the locality and the state. Both Exhibit 5 and 6 assume no academic difference exists between a public school or private school / homeschool student.

EXHIBIT 5 - Return on Investment (No Additional Investment, 18 Years to Parity with Minnesota, in $ millions)

		With Investment		Without Investment	
		With PCESA	Without PCESA	With PCESA	Without PCESA
Best Case	Cumulative Benefits	$ -	$ -	$529,245	$529,245
	Cumulative Costs	$ -	$ -	$298,056	$313,651
	Return on Investment	NA	NA	77.6%	68.7%
Worst Case	Cumulative Benefits	$ -	$ -	$298,659	$298,659
	Cumulative Costs	$ -	$ -	$298,056	$313,651
	Return on Investment	NA	NA	0.2%	-4.8%

EXHIBIT 6 - Return on Investment (With Annual $143M Budget Investment, 10 Years to Parity with Minnesota, in $ millions).

		With Investment		Without Investment	
		With PCESA	Without PCESA	With PCESA	Without PCESA
Best Case	Cumulative Benefits	$ 419,180	$ 419,180	$ -	$ -
	Cumulative Costs	$ 162,679	$ 169,515	$ -	$ -
	Return on Investment	157.7%	147.3%	NA	NA
Worst Case	Cumulative Benefits	$ 236,244	$ 236,244	$ -	$ -
	Cumulative Costs	$ 162,679	$ 169,515	$ -	$ -
	Return on Investment	45.2%	39.4%	NA	NA

In the case of no investment (Exhibit 5), ROI is between -4.8% and 0.2%. The 5% difference in ROI performance is attributable to the presence (0.2%) or absence (-4.8%) of a PCESA.

With an investment of $143 million per year over 10 years (Exhibit 6), the time to gap closure is reduced from 18 years to 10 years. Because of the reduced time and effects of discounting, ROI investment is

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improved dramatically to 39.4% without the PCESA or 45.2% with the PCESA, a difference in ROIs of 5.8%.

5.1.2 Per Capita Income and Median Household Income

Exhibits 7 and 8 identify the increase in Income per Capita and median Household Income, assuming no additional investment. Hanushek's Worst Case and Best Case scenarios are illustrated. The impact of private school academic advantage in each case is also illustrated.

EXHIBIT 7 - Locality Impact With No Additional Investment, 0 Points Private School Academic Advantage, 18 Years to Parity with MN, Hanushek Worst Case (2015 dollars)

Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)
Urban Avg.	**Urban Avg**	**Urban Avg.**	**Urban Avg**
$ 2,120	7.7%	$ 5,734	8.1%
Rural Avg.	**Rural Avg.**	**Rural Avg.**	**Rural Avg.**
$ 1,952	9.0%	$ 5,040	9.3%
Average	**Average**	**Average**	**Average**
$ 2,055	8.2%	$ 5,466	8.5%

EXHIBIT 8 - Locality Impact With No Additional Investment, 6 Point Private School Academic Advantage, 18 Years to Parity with MN, Hanushek Best Case (2015 dollars)

Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)
Urban Avg.	**Urban Avg**	**Urban Avg.**	**Urban Avg**
$ 3,756	13.6%	$ 10,161	14.3%
Rural Avg.	**Rural Avg.**	**Rural Avg.**	**Rural Avg.**
$ 3,460	15.9%	$ 8,930	16.4%
Average	**Average**	**Average**	**Average**
$ 3,642	14.5%	$ 9,686	15.1%

In both the "No Investment" Worst Case and Best Case Scenario, average Income per Capita and median Household Incomes in both urban and rural localities increase. In absolute numbers, urban communities realize a slightly higher increase; however, in relative terms, rural communities, as a percentage of their current Income per Capita or median Household Income rise a greater amount (9.0% vs. 7.7% and 15.9% vs. 13.6%, respectively).

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Exhibits 9 and 10 illustrate the average impact on an urban or rural locality under the "With Investment" Worst Case and Best Case scenarios, respectively.

As in the "With No Investment" scenario, average Income per Capita and median Household Incomes in both urban and rural localities increase, but are greater in amount and higher in percentage, relative to their values in 2015.

EXHIBIT 9 - Locality Impact With $143M Additional Investment per Year for 10 Years, 10 Years to Parity with MN, With PCESA, 0 point Academic Advantage, Worst Case (2015 dollars)

Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)
Urban Avg.	**Urban Avg**	**Urban Avg.**	**Urban Avg**
$ 2,759	10.0%	$ 7,465	10.5%
Rural Avg.	**Rural Avg.**	**Rural Avg.**	**Rural Avg.**
$ 2,542	11.7%	$ 6,560	12.1%
Average	**Average**	**Average**	**Average**
$ 2,675	10.7%	$ 7,115	11.1%

EXHIBIT 10 - Locality Impact With $143M Additional Investment per Year for 10 Years, 10 Years to Parity with MN, With PCESA, 6 Point Private School Academic Advantage, Best Case (2015 dollars)

Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)
Urban Avg.	**Urban Avg**	**Urban Avg.**	**Urban Avg**
$ 4,888	17.7%	$ 13,224	18.6%
Rural Avg.	**Rural Avg.**	**Rural Avg.**	**Rural Avg.**
$ 4,500	20.7%	$ 11,615	21.3%
Average	**Average**	**Average**	**Average**
$ 4,738	18.9%	$ 12,602	19.7%

Across all four possible outcomes for rural localities, the Best Case is an expected increase in Income per Capita of $3,460 (15.9%) and $4,500 (20.7%) per Capita ("without investment" and "with investment," respectively) or Worst Case, $1,952 (9.0%) and $2,542 (11.7%) per Capita ("without investment" and "with investment," respectively).

Expected results depend on the probability one assigns to the likelihood of either Hanushek's Scenario 1 or Scenario 4 actually occurring. Scenario 1 (Best Case) assumes all states raise their performances to

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that of Minnesota within the next 10 years. Scenario 4 (Worst Case) assumes Virginia attempts to close its test score gap in the next 10 years, and all the other states do not. Because the current strategy and future projected performance of each state is unknown at this time, it is most likely that, in the absence of greater financial investment, Hanushek's Scenario 4 is more probable than Scenario 1. A rough order of magnitude estimate of rural Virginia per Capita income increase using expected monetary valuation and the following assumptions is $2,766 (12%) (2015 dollars). A similar calculation projects a rise in median Household Income of $7,142 (13.1%). The assumptions in these calculations are:

- The United States Congress has recently re-enacted the Elementary and Secondary Education Act (ESEA) as the Every Student Succeeds Act (ESSA). ESSA provides greater autonomy and resources to all the states. This improves the likelihood that all states will seek to improve their collective educational performance over the next four years.
- Virginia is facing budget shortfalls but is a very education friendly state. On average Virginia's per pupil expenditure rate, during both up and down budget cycles, has grown over the past 10 years at 2.6% or about 0.2% above inflation. Continued investment will most likely continue at this rate.
- Considering these assumptions, a 30% probability was assigned to Hanushek's Scenario 1 and 70% to Hanushek's Scenario 4. The mean value of Best Case outcomes ($3,920) and Worst Case Outcomes ($2,210) were weighted by their respective probability (30% and 70%, respectively) to calculate the Expected Monetary Value.

A more rigorous analysis, using expert judgement and Monte Carlo analysis, may yield a more accurate forecast and a range of variance; however, the reported estimate is sufficient for management decision making. Independent of the local economic effect, the model projects that the enactment of the PCESA legislation will lower the cost of the two scenarios by between $6.8 billion and $16 billion (Worst Case and Best Case, respectively).

Beyond the quantitative projections, qualitatively one would expect rural LSD outcomes that mirror those experienced in the Edgewood Horizon study. Edgewood saw new housing developments start, property values increase, and private school capacity increase. Two years into the experiment, a survey of families in the Horizon program found that eleven percent (11%) of families surveyed had moved to Edgewood to take advantage of the program.[42] John Norquist, mayor of Milwaukee from 1988 until 2004 during the implementation of the MPCP, said that when school choice becomes a reality, "the central city economy will pick up, property values will rise, racial integration will increase, and central city test scores will rise."[43] Improved education translates into positive economic outcomes.

[42] Op Cit [15], p. 25

[43] Green, J., Peterson, P. "Race Relations and Central City Schools: It's time for an experiment with vouchers," Brookings Institution, March 1998, [https://www.brookings.edu/articles/race-relations-central-city-schools-its-time-for-an-experiment-with-vouchers/]

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5.2 Parental Choice Education Savings Accounts Will Have an Overall Positive Fiscal Impact on Rural Public Education

Assuming the PCESA is enacted, locality savings are generated by budgeted variable per pupil expenditures that exceed the LSD's budgeted fixed cost. State savings are generated by budgeted variable per pupil expenditures that are not touched by the PCESA (viz., Incentive Funding, Categorical Funding, Lottery Funding, and Other Funding). The model assumes that locality savings are retained by the locality and are available to the locality for discretionary reinvestment in the students who remain in the public school system or redirected to other local needs. State savings are used first to cover any local school district fixed costs which are not met by the locality and then remaining state funds are available to the state for reinvestment in the public school system or redirected to other state needs.

Exhibit 11 summarizes the net savings generated by the PCESA in the first year, assuming an enrollment rate of 4.06%. Total net savings is $179.2 million.

Exhibit 11 - Projected Savings beyond LSD fixed cost and VDOE PCESA Guaranteed Savings

	LSD Savings beyond Fixed Cost	VDOE Savings Beyond Guaranteed
Rural	$3,183,215	$11,469,648
Urban	$104,217,076	$60,310,653

Rural districts comprise 51 of 132 modeled. Of the 51, 28 require a total of $609,000 in funding (on average $21.8 thousand per LSD) from the state savings to breakeven on fixed costs if the PCESA is enacted. The remaining 23 generate $3.2 million in LSD savings beyond fixed cost (on average $128,000 per LSD).

Qualitatively, the Edgewood program found that over the 10-year program,[44] participants increased their state math test scores 28%. Over the same period, public school dropout rates decreased by 30%; per pupil spending increased by 57.3%; teachers' salaries increased by 37.2% (outpacing surrounding districts by 70.6%). More than 92% of participants chose to attend college. Notionally, the PCESA should improve performance in each of these categories, although, because of differences in the program structure and population demographics, the absolute value of these gains is difficult to quantify.

[44] Op Cit [15]

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5.3 Education Choice Will Not Create a Mass Exodus of Students From the Public Education

Based on the model, first year demand for a PCESA is estimated to be 4.06% of public school ADM. Of this number, 3.45% will choose to attend private school and the remainder (0.61%) will choose to homeschool. This rate compares favorably to the Edgewood Horizon program and MPCP experience, where first year enrollment was approximately 5.7% of the eligible population. However, in these two programs, scholarship amounts were a much larger fraction of the per pupil expenditure (~ 45% to 65%) than the PCESA (~ 30%).

To place in context the effect of the PCESA on public school enrollment, Virginia law limits public schools class size to 29. On average, current class size is 23.[45] Assuming 4.06% of current public school students choose to take a PCESA, the impact is slightly less than 1 student per class, on average.

At the peak of the Horizon program, 87.2% of Edgewood students chose to remain in district public schools. Over the 10-year program, the average percentage of Edgewood students who remained in district schools was 90.5%, despite having the opportunity to transfer. Another lesson learned from the Edgewood experiment is that students who applied for the program were not the most academically qualified. Generally, they were: (1) the most academically challenged (37th percentile in math and 35th percentile in reading); (2) the poorest (the families choosing to participate in the program had family incomes 60% less than those who chose to remain); and (3) showed no difference in behavioral and attendance profiles than those students who stayed in the public school system.

5.4 Education Choice Will Not Adversely Impact Teachers and Their Salaries

The impact of education choice on teacher pay, in the long term, is highly dependent upon the public education system's response to parents' demands for quality education. Initially, the direct impact is minimal, and because net savings are generated for each student who leaves and are available for reinvestment in the students who remain in public school, impact is further mitigated. The following paragraphs quantify the initial impact of education choice and qualitatively assess what the long term impact might be.

Teacher pay varies widely across Virginia. The median pay is approximately $50,000 (range $38,000 (10th percentile) to $68,000 (90th percentile)). Assuming a class size of 23 and an average per pupil expenditure of $11,523 per pupil, a teacher generates ~$265,000 in revenue per year. Approximately 6.7% percent of this expenditure is a federal government pass-through and 31% is fixed cost required to keep the administrative and physical infrastructure of the school operating. After fixed costs are deducted, approximately $165,000 is left and represents the variable costs associated with delivering an

[45] National Center for Education Statistics, Schools and Staffing Survey, 2011-2012 [https://nces.ed.gov/surveys/sass/tables/sass1112_2013314_t1s_007.asp]

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education to each of the 23 students. This includes teacher salary and benefits; a pro rata share of the school staff; and all variable costs associated with student education (viz., books, paper, pencils, etc.).

Further assume that the teacher's pay and benefits are fixed instead of variable. This constraint reduces classroom variable expenses from $165,000 to $95,000 per classroom. The remaining $95,000 is $4,130 per student. The average PCESA is valued at approximately $3,500. Even under the assumption that the teacher is a fixed cost, not a variable cost, sufficient money exists to pay the teacher if that is what the locality and state choose to do, although treating the teacher as a fixed rather than a variable expense necessarily will reduce savings to both the locality and the state.

In the longer term, basic economics will drive what happens to teachers and their pay. In the short term, impact is minimal and money is saved, which can be reinvested in the remaining students or reallocated to other local or state purposes. In effect, student-to-teacher ratio goes down and per pupil expenditure goes up, assuming reinvestment. In the longer term, competition and the quality of education, as judged by the parent, will determine the size and scope of public versus private education in the state. Because the number of students – regardless of their education mode – drives the number of teachers required to deliver the education, teachers will necessarily move with the students based on the laws of supply and demand. Ultimately, per pupil expenditure in the public school will come into balance with the pricing point at which the value of a PCESA is attractive to a parent. In the Edgewood program, during the first 8 years, EISD teacher salaries increased 37.1% compared to surrounding school districts, which posted 21.8% gains.[46]

According to Mary Sanchez, an EISD teacher for 33 years, "From an internal standpoint, Edgewood had to change in order to better compete with the Horizon Scholarship Program. Everybody from the administrators to the teachers knew that a possibility existed that the district would hemorrhage students with the new program, so we had to become proactive in working to keep our students and to keep parents happy with the school district. We began offering more tutoring options and … programs to keep students engaged in the education process. Teacher salaries had to go up in order to compete with other school districts for better teachers."[47]

6.0 Conclusions

The conclusion of this research is that: (1) education choice will produce positive economic outcomes in rural districts; (2) education choice will not have negative fiscal impact on rural public education; (3) education choice will not create a mass exodus of students from the public education system; and (4) education choice will not adversely impact teachers and their salary. Projected academic, economic, and fiscal projections are consistent with long-term results reported in longitudinal studies of two actual programs – The Bexar, Texas, Edgewood ISD Horizon Program and the Milwaukee Parental Choice

[46] Op Cit [15], pg. 22-23
[47] Ibid

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Program. In the Horizon program, participants self-selected; in the MPCP, participants were randomly selected.

More important, the Horizon Program suggests that it is not the type of education choice that is important; it is the fact that the parent has a choice and the act of choosing that creates competition and results in efficient allocation of scarce resources to their best use. The result is academic, economic, and fiscal improvement. Ultimately, competition between all forms of education delivery (public schools, private schools, homeschools, virtual schools, etc.) will be necessary in order to improve both student and public school academic performance to levels that will optimize macroeconomic value.

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APPENDICES

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Impact of Parental Choice Education Savings Accounts on Rural Virginia Counties

APPENDIX A: Analytical Models

This paper's economic projections were derived by extending the work of Hanushek, et al, to Virginia localities. Fiscal impact projections are generated through three additional models: (1) the PCESA Model; (2) the Supply / Demand Model; and (3) Fiscal Impact Model. The details of each model are discussed in this Appendix.

Extension of Hanushek Economic Model to Virginia Localities

Hanushek's methodology is extended to create a Virginia Economic Model. Hanushek's projected GDP growth, directly related to education improvement, is allocated to Virginia localities (cities, counties, and towns). This improvement is converted into Personal Income per Person and Median Income per Household, using the following methodology.

1. All local school districts are assigned to rural and urban localities, using the definition of those terms as accepted by the National Center for Education Statistics and promulgated by the United States Office of Management and Budget. [48,49]

2. Regression methods were used to test the correlation between NAEP (8th Grade Math) scores[50] and GDP per Capita[51] for Virginia, Massachusetts, and Minnesota for the period 2003-2015. Minnesota and Massachusetts were chosen because both states consistently demonstrate the superior performance on the NAEP over time. Statistical tests resulted in a correlation coefficient of 71.4% and P-value of 0.000856 assuming a level of significance (α) of 0.01, indicating a strong correlation between the two variables, as reported by Hanushek.

3. Using Federal Reserve Economic Data (FRED)[52], Virginia's growth in GDP over the period 2002-2015 was determined to average 3.9% per year. The net present value of Virginia's GDP growth over an 80-year period was calculated to be $2.096 trillion. Using Hanushek's Scenario (1) and (4), the GDP growth estimate attributable to education improvement ($1.45 trillion and $0.811 trillion, respectively) represents between 27% and 41% of total GDP growth. This is consistent with Hanushek's conclusion: "[w]e find that differences in achievement and attainment account for 20% to 35% of the current variation in per-capita GDP among states."[53]

4. Because GDP per Capita is not reported on a state political subdivision level (viz., county, city, or town), Personal Income per Capita (for persons in the workforce over 16 years of age) was used as a proxy. Regression methods were used to test the correlation between Gross Domestic

[48] USDA Maps [http://www.ers.usda.gov/datafiles/Rural_Definitions/StateLevel_Maps/VA.pdf]
[49] National Center for Educational Statistics [https://nces.ed.gov/surveys/ruraled/definitions.asp]
[50] NCES National Assessment of Education Progress [https://nces.ed.gov/nationsreportcard/]
[51] Federal Reserve Economic Data (FRED – ST. Louis) [https://fred.stlouisfed.org/]
[52] Federal Reserve Economic Data (St. Louis) [https://fred.stlouisfed.org/series/VANGSP]
[53] Op Cit [4], page 58.

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Product (GDP) per Capita and Income per Capita for the Commonwealth of Virginia over the period 2002-2015.[54] Tests resulted in a correlation coefficient of 99.5% and P-value of <<.00001. Assuming a level of significance (α) of 0.01 results indicated a very strong correlation between the two variables. Therefore, GDP per Capita, appropriately factored for both its linear, highly correlated relationship to Income per Capita and local population (i.e., persons greater than 16 years of age in the workforce can be used to allocate increases in education-related GDP improvement to a locality).

5. For all Virginia local school districts (LSDs), Standards of Learning (SOL) test data (Math 8th Grade) and Average Daily Membership (ADM, viz., attendance data) was collected and analyzed for the period 2011 to 2015 (corresponding to NAEP (Main, Math 8th Grade) test years 2011, 2013, and 2015). Three years' SOL test data (2011, 2013, 2015), by LSD and corresponding to the years in which the NAEP was conducted, were averaged and weighted by ADM to calculate the individual LSD's contribution to an overall Virginia Composite Math 8th Grade SOL score for the five-year period. The Composite SOL score was equated to the five-year NAEP average score over the same period.

6. Using the results of Step 4 and Minnesota's 2015 Math 8th Grade NAEP score, Minnesota was assigned an equivalent Virginia SOL Math 8th Grade score (referred to herein as "Equivalent Score"), establishing a "NAEP performance gap" that must be closed if Virginia's NAEP performance were to be equivalent to Minnesota's performance.

7. In the Best Case, an assumption was made that the NAEP performance gap will be closed, over a 10-year period consistent with the Hanushek study, by rural and urban LSDs, whose current 5-year average Math 8th Grade SOL scores were below the Equivalent Score. All other LSDs were assumed to maintain their current score. Within these constraints, an iterative model was run (using individual, underperforming LSDs ADM-weighted contribution to NAEP gap closure) to determine on average the percent improvement that all underperforming LSDs must achieve on their running, five-year SOL test scores to close the NAEP gap. This average improvement was calculated to be 25%. This target is consistent with improvement in math scores achieved by EISD (28%) over a 10-year period.

8. Hanushek's calculated improvement in GDP (viz., Scenario (1) or (4)) was then converted to an equal series of 80-year disbursements, assuming 3% inflation (Hanushek's assumption), and allocated to each rural and urban locality in proportion to their individual contributions to NAEP gap closure. GDP was converted to GDP per Capita, by dividing by city, town, or county total population. GDP per Capita was converted to Income per Capita using the correlation determined in Step 4 above. The relationship between individual LSD population data and households derived from Census data was used to estimate the individual LSD's estimated increase in Household Income.

[54] Ibid

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PCESA Model

The following paragraphs describe how Local School District PCESA amounts are calculated.

In the PCESA model, Report Table 13 (Disbursement) "Instruction" expenditures[55] (on average 66% of total per pupil expenditures) are assumed to be the only PPE variable costs. Instruction costs include classroom technology, classroom instruction, guidance services, social work services, homebound instruction, instruction improvement, media services, and office of the principal. **When a student is removed from the public school, a pro-rata share of this variable cost is taken from the school budget to cover the cost of the PCESA. Remaining budgeted variable costs, which are not used to fund the PCESA, remain as savings to the locality or to the state, as calculated below.**

All other expenditures in Report Table 13 (on average 34% of total per pupil expenditures) are fixed costs and are associated with the ongoing fixed costs of operation of the local school district. The PCESA funding model does not touch federal funds, which are assumed to be fixed costs and are passed through to the locality, directly. **When a student is removed from the public school, fixed costs, beyond federal funding, remain and are covered in the model.** Budgeted locality funding, which is not required to cover the calculated fixed cost requirement, remains as savings to the locality, as calculated below.

Fixed cost examples include the following costs (and the technology budget associated with each). These costs fund the ongoing operation of the local school district's administration and infrastructure and are not touched by the PCESA.

- Administration: Local School Division Operations, Board services, executive administration, information services, personnel, planning services, fiscal services, purchasing, and reprographics.
- Attendance and Health Services: Expenditures for activities that promote and improve attendance at school and those activities relating to health services for public school students and employees. Medical, dental, psychiatric, and nursing services are included in this category.
- Pupil Transportation Services: Expenditures related to conveying students between home and school and to and from school activities, as provided by state and federal law. Costs related to vehicle maintenance and management and monitoring of transportation process are included in this category.
- Operations and Maintenance Services: Expenditures incurred to keep grounds, buildings, and equipment safe for use and in effective working condition. Costs related to operations management are included in this category.
- School Food Services: Expenditures for providing food to students and staff, including preparing and serving meals for school related activities.

[55] Op Cit [33]

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- Summer School: Expenditures incurred for the delivery and improvement of both remedial and non-remedial summer school programs.
- Adult Education: Expenditures incurred for the delivery of adult education programs.
- Pre-Kindergarten: Expenditures incurred in the delivery of pre-kindergarten programs.
- Other Educational Programs Expenditures for activities sponsored by the school division that do not involve the delivery of instruction or other ancillary activities for grades K-12 students (excluding pre-kindergarten programs). These programs include enterprise operations, community service programs, and other non-LEA programs.
- Facilities: Facilities-related expenditures including acquiring land and buildings, remodeling and constructing buildings, installing or extending service systems and other building equipment, and improving sites.
- Debt Service and Transfers: Expenditures related to paying the school division's debt, including debt and payments on both principal and interest.

The following is an example of how the model allocates cost, using Accomack County, Virginia, (2015) as an example. All data is taken from the Superintendent's Report (2015) Table 14A and Table 15[56].

Exhibit A-1 - Accomack County Example

Cost Element	Amount	Variable Name	Notes
Data			
Average Daily Membership	5,185.19	ADM	Table 15
Local Per Pupil Budget:	$3,379	LPP	Table 15
State Per Pupil Budget:	$4,962	SPP	Table 15
State Retail Sales and Use Tax Per Pupil Budget:	$919	SRT	Table 15
Federal Per Pupil Budget:	$1,226	FPP	Table 15
Total Per Pupil Budget	$10,486	TPP	LPP+SPP+SRT+FPP

[56] Op Cit [33]

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Cost Element	Amount	Variable Name	Notes
PCESA Calculations			
90% of Accomack County Per Pupil Standards of Quality (SOQ) budget (Table 14A) to Fund PCESA:	$3,440	ESA	Calculated from Table 14A and ADM
10% of Accomack County Per Pupil SOQ budget (Table 14A) to Fund VDOE Administrative Fee:	$382	SAE	Calculated from Table 14A and ADM
Variable / Fixed Cost Calculations			
Variable Cost Percentage	72.9%	VCP	Accomack Table 14A "Instruction Line" divided by "Total Cost of Operations Regular Day School" divided by Accomack ADM
Fixed Cost Percentage	27.1%	FCP	1-VCP
Variable Cost of Operation	$6,749	VCO	VCP x (TPP-FPP)
Fixed Cost of Operation	$2,511	FCO	VCO x (TPP-FPP)
Distribution of Cost / Savings with PCESA			
Local Cost of Operation with PCESA Student	$2,511	LCO	LCO = FCO
Federal Per Pupil Disbursement	$1,226	FPP	Table 15
PCESA Disbursement to Parent	$3,440	ESA	Calculated from Table 14A and ADM

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Cost Element	Amount	Variable Name	Notes
PCESA Admin & Guaranteed Savings	$382	SAE	Calculated from Table 14A and ADM
Savings to LSD After PCESA Disbursements	$868	STL	LPP-LCO
Savings to State After PCESA Disbursements	$2,059	STS	SPP+STT-ESA-SAE
Financial Balance Check			
Check on Calculated Disbursements	$0	CheckSum	TPP-(LCO+FPP+ESA+SAE+STL+STS)

To place the PCESA model in context, actual individual LSD's performance varies because of the manner in which schools are funded (viz., Virginia's Composite Index Formula[57]). The projection model illustrated in Exhibit 6 takes this into account by calculating the PCESA economics for each individual LSD and reconciling surpluses and deficits by LSD. For the average LSD, the financial pro forma is illustrated in Exhibit A-2

Exhibit A-2 Average LSD Financial Pro Forma

Average LSD Proforma	
LSD Fixed Cost	$3,572
LSD Savings	$2,377
Federal Funding	$772
PCESA	$3,175
State 10% Adm.	$353
Addl State Savings	$1,275
Average PPE	**$11,523**

Supply / Demand Model

The propensity of a parent to select a private school is calculated three ways. The first comes from the peer reviewed literature on economics of education. The second and third come from the Milwaukee MPCP and Edgewood Horizon program experiences.

[57] Virginia Department of Education, [http://www.doe.virginia.gov/school_finance/budget/compositeindex_local_abilitypay/]

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The propensity of a parent to select private school is shaped by both the elasticity of demand and elasticity of supply for private school choice. In the model, elasticity of demand is calculated using the Chiswick – Koutroumanes (CK) coefficient,[58] adjusted for inflation. CK found that parents are motivated by many factors other than tuition cost – concern over violence, religious conviction, curriculum, teaching method, discipline, complete cost of the decision (time and money), et cetera. CK also found that several factors did not have a significant effect on parents' decision to choose private school: student's gender, average public school test scores, and Hispanic origin. According to CK, a $1.00 reduction in private school tuition in 1990 increased the probability of choosing a private school by 0.0021 percent.[59] When adjusted for inflation at 2.4% per year over the period 1990-2015, the CK coefficient is 0.001161 percent. For example, a $4,000 tuition reduction will increase probability of a parent choosing private school by 4.6%. For a public school with an enrollment of 1,000 students, all things being equal, 46 students will choose to attend private school.

Unlike Milwaukee and Edgewood, which were implemented in urban environments, another factor that affects the propensity to attend private school is school availability and accessibility, especially in rural Virginia where some counties have few public schools, fewer private schools, and longer travel distances. The model handles this by defaulting selection to "homeschool only" if the LSD has fewer than 8 public schools or less than two existing private school. The basis for this logic is that a strong linear relationship exists between the number of existing public and private schools in each district.[60] If an LSD has 8 public schools, the correlation suggests that a market for one private school should exist even if one does not. Similarly, the existence of one private school, regardless of the number of public schools, demonstrates potential market demand for a private school.

Therefore, if an LSD has at least 8 public schools or at least 1 private school then the number of students one would expect to take a PCESA and send their child to private school in a town, city, or county school district is given by the district private enrollment (**PER**) formulae:

$$PER_i = P_i\{0,1\} \times CK \times ESA_i \times ADM_i \quad [1]$$

where the variables, CK, ESA, and ADM are previously defined and the subscript "i" indicates the variables are specific to a locality. $P_i\{0,1\}$ is a bimodal logic function that tests to determine if the locality has at least 8 public schools or at least one private school and if either test is met, $P_i\{0,1\}$ is set to one, otherwise it is set to zero.

If PER represents the number that attend a private school, using a PCESA stipend, then the number who choose homeschool are similarly motivated in many respects to the private school enrollee, but choose

[58] Chiswick, B., Koutroumanes, S., "An Econometric Analysis of the Demand for Private Schooling," Research in Labor Economics, Vol. 15 (1996), pp 209-237.
[59] Ibid, p. 229
[60] Author's regression calculation using actual data. Correlation is approximated by $y = 0.5505x - 2.6582$, $R^2 = 0.9458$, $\alpha=.05$, $P << .01$, and x equals number of public schools and y equals number of private schools.

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to homeschool for additional reasons[61] (herein referred to as homeschool propensity (HSP_i). Therefore Homeschool Enrollment, by locality, (HSE_i) can be expressed by the formulae:

$$HSE_i = CK \times ESA_i \times ADM_i \times HSP_i \quad [2]$$

where Home School Propensity (HSP_i) is a factor that recognizes that an additional fraction of parents may wish to send their child to private school but cannot or do not for economic or other reasons. HSP_i is shaped by two factors: (1) homeschool preference (PRE_i) and (2) demographic factors that are unique to homeschool parenting (DEM_i).

PRE_i is the percentage of the recipients expected to homeschool based on generalized, historical averages. PRE_i is calculated by averaging current Virginia, current National, and prospective Virginia-specific ratios (based on survey) of homeschool enrollment to private school enrollment. For example in Virginia today, 8% of students attend private school (102,000) and 2.2% (29,000) are homeschooled. The remainder (89.8%) attend public school or charter school. Nationally, 10.2% attend private school and 3% are home schooled. DiPerna, in his 2009 survey,[62] reports that if given a free choice, 39% will choose private school and 11% will choose homeschool. Therefore, based on Virginia averages, 27.5% (=2.2/8) of parents who otherwise would have sent their children to private school will select homeschooling. Similarly, in the National case, 29.4% (=3/10.2) will select homeschooling. Based on Virginia survey data, 25.7% (=9/35) will select homeschooling. Therefore, the value of PRE_i used in the model is the average of these values or 27.3%.

PRE_i is the fraction of PCESA recipients who will, on average, select homeschool. However, individual localities are not "average;" they are unique. Research has shown that the homeschool population is determined by specific demographic factors, which may vary widely between localities. The DEM_i factor (0% to 100%) measures the degree to which a locality matches these factors.

DEM_i is derived from a study of the literature[63] which identifies the following demographic dimensions, in order of priority, that define a localities' propensity to homeschool: (1) ethnicity (STRONGEST FACTOR, 87% are white); (2) number of parents in the home (2 or 1); (3) number of parents in workforce (2, 1, 0); (4) median household income level (by Census Bureau level); (5) and location (Urban, Rural). In the model, each of these dimensions is assigned a weight based on its relative contribution to the overall profile. Digest of Education Statistics data is used to rate each locality in each of these dimensions. The result is a composite score for the locale's DEM_i that measures its receptivity to homeschooling (0% - not receptive, 100% - fully receptive).

[61] Ray, B., "Research Facts on Homeschooling," National Home Education Research Institute, March 2016 [http://www.nheri.org/research/research-facts-on-homeschooling.html]
[62] Op Cit [10]
[63] National Center for Education Statistics, Homeschooling in the United States, [https://nces.ed.gov/pubs2006/homeschool/characteristics.asp]

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The number of students who attend homeschool in a specific locality [2] becomes:

$$HSE_i = CK \times ESA_i \times ADM_i \times PRE_i \times DEM_i \quad [3]$$

Total PCESA enrollment (TER_i) in a locality is the sum of private school enrollment and homeschool enrollment in that locality:

$$TER_i = PER_i + HSE_i \quad [4]$$

Inserting HSE_i from [3] into [4] and factoring, the total enrollment in a locality receiving a PCESA is:

$$TER_i = [P_i\{0,1\} \times CK \times ESA_i \times ADM_i] + [CK \times ESA_i \times ADM_i \times PRE_i \times DEM_i]$$

$$= CK \times ESA_i \times ADM_i [P_i\{0,1\} + PRE_i \times DEM_i] \quad [5]$$

Note that because $P_i\{0,1\}$ is logic driven and can assume only the value of 0 or 1, based on the combination and number of public and private schools in a district, only two outcomes are possible: (1) some localities will have both private school and homeschool PCESA recipients or (2) some localities will have only homeschool PCESA recipients. A locality's number of PCESA homeschool recipients is determined by a fixed historical percentage of the private school eligible students ($PRE_i = 27.5\%$) and the congruence of a locality's demographics to those that match the typical homeschool family ($0 \leq DEM_i \leq 1$).

Equation [5] estimates private school and homeschool demand. One must also consider the supply response. The following scenarios were considered:

- **Large initial demand results in a private school tuition increase due to under-capacity.** This is not a significant problem for the following reasons.

  As modeled, initial demand in the first year is projected to be approximately 4.06% of total public school average daily membership. Of the 4.06%, 3.45% are private school students and 0.61% are homeschool students. These numbers are less than EISD and MPCP in the first year (5.8% and 5.75%, respectively) and in the second year (6.8% and 7.62%, respectively), principally because the value of the PCESA relative to total PPE (~ 30% of the total) is less than EISD (66%) or MPCP (45%). Even with a higher scholarship value, experience in these states demonstrates that private schools can increase capacity quickly, certainly within the first two years of the implementation of any program. Neither MPCP nor EISD saw significant increases in private school tuition following adoption of scholarship programs[64].

  Second, no economic input, which is required to scale K-12 private education or homeschooling, is scarce or specialized. Physical capacity exists. Private schools can choose to operate in a

[64] Op Cit [17], pg 12

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variety of buildings other than traditional school buildings and homeschools operate from homes, which are available and relatively inexpensive.

Additional teacher labor capacity exists. According to the Bureau of Labor Statistics, 92,000 K12 teachers entered the market in 2014, with a projected growth rate of 6% per year.[65] Also, public school and private school teachers are relatively interchangeable, and public school teachers may follow their students to private school, as demand increases.

Growth in the model is delimited to geographies that either have operating private schools or a sufficient number of public schools that indicate a potential demand for more private schools. If existing private schools choose not to open their doors to new students, many parents, teachers, and entrepreneurs are willing to open new schools, using the PCESA as capital.

- **Parents whose students are currently in private school are not eligible to receive a PCESA and may dis-enroll their student from private school and put them in public school to qualify for a PCESA.** PCESAs will incent 4.06% of public school students to transfer from public school to private school or homeschool. This means that ≈ 96% of parents do not view the cost of private education as a deciding factor in choosing a private school or homeschool. Among parents, who already have children in private school or homeschool, the percentage who believe cost is not an obstacle is most likely higher, since they have already chosen their mode of education. Therefore, the percentage of parents who would opt to dis-enroll their student and enroll them in private school is no more than 4.06% of the non-public school average daily membership.

  Students entering public schools from private schools are fully counted in public school ADM, and students who leave the public school system actually create variable cost savings. The net fiscal impact on the public school of one child transferring from the public school system to the private school system (e.g., a transfer student) is to decrease the total number of students leaving the public school system by one and debiting the projected total PCESA savings by the marginal additional cost of transfer student costs to enroll in the public school system. If the transfer student then goes back to private school in the second year, they only impose the cost of the PCESA grant (viz., from a fiscal standpoint their impact is no different than any other public school student who takes a PCESA). The impact of this effect is accommodated in the model probabilistically by a Monte Carlo simulation of the Fiscal Impact Model using a private-to-public transfer rate distribution that is triangular and the most optimistic case for the transfer rate is 0% (base case), most likely case is 3.65% (first year assumed enrollment rate in overall life-cycle model), and the most pessimistic case is 4.06% (projected first-year private school and homeschool enrollment rate).

[65] Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2016-17 Edition*, High School Teachers, on the Internet at http://www.bls.gov/ooh/education-training-and-library/high-school-teachers.htm

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Fiscal Impact Model

Virginia uses a Composite Index Formula (CIF) to allocate state funding to localities. CIF considers a number of factors, principal among which is a calculation of the locality's ability to fund basic Standards of Quality (SOQ) requirements. In poorer urban or more rural localities, state funding may comprise a larger portion of the total per pupil funding and may be required for the locality to meet its fixed cost of operation. In larger, more prosperous localities, state funding goes almost totally to funding variable costs. Locality budgets are sufficient to cover their fixed cost and provide additional educational services beyond basic SOQ.

The PCESA Model calculates fixed and variable costs at the local level, allocates back to the locality the fixed cost of operations, subtracts out the PCESA scholarship cost (including the Virginia Department of Education's (VDOE) guaranteed 10% administrative / incentive fee), and then allocates remaining variable cost to either (1) locality savings (losses) and / or additional VDOE savings (losses). The Fiscal Impact Model accumulates, across all localities, total additional state savings from all localities and then reallocates a portion of these additional state savings back to LSDs where deficits exist. After reallocation, all LSD budgets have either no impact (viz., zero locality savings) or a positive impact (viz., positive locality savings). Remaining state savings, after the reallocation to close deficits, is reported as a Net Savings to the VDOE, and available for reinvestment in other public education initiatives.

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APPENDIX B: Horizon School Choice Program Description

Beginning in the fall of 1998, the CEO Foundation, in coordination with the Walton Foundation and the Covenant Foundation started a voucher program called the Horizon Program in the Edgewood Independent School District (EISD, Bexar County, TX). A combined $52.4 million dollar grant was used, over a period of 10 years, to provide student scholarships to any PK12 student who physically resided in EISD. EISD was one of the poorest and most underperforming school districts in Texas. EISD consisted of a 14,000 student body, of which 98% were minority, 97% were Hispanic, and 97% where economically disadvantaged.

The purpose of the 10-year program was to answer the overall question "Does school choice improve public education?" If a PK12 student resided in EISD, the student received a $3,600 voucher to attend a PK-8 private school or a $4,000 voucher to attend a Grade 9-12 private school. Private school tuition outside the district was reimbursed at $2,000 (PK-8) or $3,500 (Grade 9-12). A student who chose a public school, other than the one to which he or she was normally assigned, received his or her state ADM allowance and a $420 voucher to normalize funding differences between localities. In essence, this program allowed parents to choose the best education for their child without regard to the "economic friction" caused by the differences between private school tuition and public school funding formulae. Rather than raising per-pupil spending and pushing it through a monolithic, one-size fits all education system (top-down funding), it allowed parents to make the choice of which programs best met their children's needs (bottom-up choice). Second, it targeted student demographics that have been proven by studies to benefit the most from an increase in per pupil spending: ethnic minority and economically disadvantaged students.

The Horizon Program results were documented in 2008, at the program's conclusion, by the Texas Public Policy Foundation.[66] Over the 10-year period, 10,000 students participated in the program, with first year participation being 770 students and growing to a maximum in its 6th year or 2,042 students. A summary of the program's results[67] are quoted from the report, below, and answer the program's research objective: "Does school choice improve public education?" The Horizon findings provide insight to the potential effect of the PCESA on Virginia rural communities, especially communities that are home to ethnic-minority, economically-disadvantaged students.

[66] Op Cit [15]

[67] Note: These results are raw results. Subsequent studies by Merrifield and Gray (See Footnote 20) place in statistical context the reported results to other "non-treatment" districts and conclude that: (1) total property value gain over the period 1998-2005 was the highest among 5 control districts, whose mean was 40.9%; (2) the number and aggregate property value of single family home growth outpaced the control group by 7.4% vs. 3.0% (1998-2008) and 95.4% vs. 94.7% (1998-2008), respectively; and (3) the program effect on residential property values offset at least $7.1 million in state funding losses. Another $5 million fiscal benefit was generated by increased graduation rates.

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1. Do scholarship students improve academically in a school of their choice?

   "In the first four years of the program, [scholarship] students dramatically improved their reading scores by 21.2 percent and their math scores by 28 percent. More than 4,000 different students received scholarships over a 10-year period, far less than 1% dropped out from school (two students). More than 400 students graduated during the 10-year period and 92 percent of the graduates chose to attend college. Ninety-eight percent of the students were minorities (97% Hispanic) and 97 percent were economically disadvantaged."

2. Will schools selected by the parents agree to take at-risk, under-performing students with discipline problems?

   "No students were denied entrance to private schools, despite the student's academic or disciplinary history. In contrast, however, all public schools – with the exception of one public school district – refused to allow these students to enroll."

3. Does school choice create a financial hardship on a school district?

   "In fact, the results of the Horizon program are quite the opposite, due in part from a very surprising source of income: reduced drop-out rates (see question #7). Revenues also increased due to the economic development brought about by new housing and other factors within the district. … Over the course of the Horizon program, … the district's overall revenues showed a biannual increases in years 1,3,5,7, and 9 of 0.2 percent, 5.2 percent, 13.4 percent, 35.5 percent, and 42.0 percent, respectively."

4. Does offering school choice cause mass exodus of students from public education?

   "At the peak of Horizon program subscription … 87.2 percent of Edgewood's students chose to remain in the district's schools. Over the 10-year program, the average percentage of Edgewood students who remained in district schools, despite having the opportunity to transfer, was 90.5 percent."

5. Does school choice cause the best and the brightest students to leave public education?

   "The opposite proved true. Parents exercising choice were most commonly the parents of low academic performers. Applicants … scored at the 37th percentile in math and the 35th percentile in reading and were reported to be on average two years behind grade level by participating schools. [Scholarship] recipients' families were the poorest of the poor, [whose total annual household income was less than $16,000]."

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6. In a school choice environment, what are the academic impacts on the students in the school district?

   "After the introduction of Horizon scholarships, Edgewood dramatically improved its academic performance outperforming 85% of school districts in Texas. By the end of the second Horizon year, Edgewood had, for the first time in its history, earned a rating of 'Recognized' from the state. By the end of the third year, Edgewood students posted even more remarkable academic increases in Stanford 9 reading and math test scores of 21.20 percent and 28.00 percent, respectively, far surpassing overall state results in the same period."

7. What is the impact of school choice on public school dropout rate?

   "Edgewood's dropout rate in the year just prior to the Horizon program was 69 percent. By the end of the sixth year that rate had dropped to 48.2 percent – a decrease of 30.1 percent due to the fact that students in the district had an option available to them other than the dropout option."

8. Does school choice cause an increase in teacher pay?

   "Edgewood teacher salaries had increased 12.7 percent over the four year period immediately before the Horizon program. By the ninth year of the choice program, teacher salaries increased by 37.2 percent – an increase that was 70.6 percent higher than the surrounding districts."

9. Does school choice stimulate economic development?

   "Property values in Edgewood had been historically declining for decades. Economic factors plus the introduction of the Horizon scholarships in Edgewood sparked dramatic increases in property taxes over the next nine years. The taxable property value per pupil increased by 114.9 percent … The first new housing developments in over 40 years were initiated shortly after the announcement of the Horizon scholarships. Their marketing brochure highlighted "[i]f you rent here, your child will get a scholarship to go to any school you choose."

10. Does school choice improve public education?

    "The data clearly shows that the Edgewood School District responded to the challenge of competing schools and outmigration of students by improving performance. Academic results, dropout reduction, revenue increases, and economic development were all areas showing sharp improvement. … The data demonstrate that the rate and breadth of the district's systemic improvement is unmatched by any other education reform or dropout prevention initiative ever implemented in the history of American education."

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APPENDIX C: MPCP School Choice Program Description

From its inception in 1990 through 1998, the Milwaukee Parent Choice Program (MPCP) remained a small pilot scholarship program limited to transfer of students from the Milwaukee Public Schools (MPS) to secular private schools and subject to restrict enrollment criteria (1% of population, ≤ 175% of poverty). Private schools were required to choose participants on a random choice basis. After the first eight years of operation, the enrollment cap was raised from 1% to 15% of Milwaukee K-12 students, and the courts ruled that religious schools could participate in the program. The MPCP expanded dramatically, doubling in size 11 times between 1997 and 2006.

In 2006, a longitudinal study of the MPCP was commissioned. Wisconsin policymakers selected the School Choice Demonstration Project (SCDP, University of Arkansas) to help answer questions about the effects of school choice in Milwaukee. During the five-year evaluation period (2006-2011), MPCP enrollments continued to grow, increasing by 18% from 17,749 students during 2006-2007 school year to 20,996 students during the 2010-2011 school year. After 2011 and the conclusion of the longitudinal study, the program was expanded to include middle-income families and schools outside of Milwaukee. Enrollment grew an additional 12%.

The SCDP's final report[68] contains a summary of the findings from 31 topical reports that comprised its comprehensive longitudinal study. The summary report does not include extensive details regarding the study samples and scientific methodologies employed in those topical studies. Readers who are interested in the data and methods that gave rise to their findings are encouraged to read the 31 topical reports, all of which are listed in the references to the summary and may be downloaded at http://www.uark.edu/ua/der/SCDP/Milwaukee_Research.html.

The longitudinal study identified the following MPCP lessons learned. These lessons learned are relevant to the PCESA program.

- Enrolling at a private high school through MPCP increased the likelihood of a student graduating from high school, enrolling in a four-year college, and persisting in college by 4 to 7 percentage points.
- When similar MPCP and MPS students were matched over four-year period, the achievement growth of MPCP students compared to MPS students was higher in reading but similar in math.
- MPCP students performed at higher levels in the upper grades in reading and science but at lower levels in math at all grade levels.
- Conversion charters (viz., charter schools which were previously private schools) clearly delivered higher achievement growth than MPS.

[68] Op Cit [31].

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- MPS students themselves performed at a somewhat higher level as a result of competitive pressure from the school choice program.
- The MPCP saved the state money – nearly $52 million in fiscal year 2011 -- although not all types of Wisconsin taxpayers benefited from the savings.
- The MPCP had no discernible effect on racial segregation of schools or housing costs across neighborhoods.
- All reported differences were statistically significant.

Most important, MPCP scholarship students were seven percentage points (7%) more likely to have graduated from high school in four years and four percentage points (4%) more likely to have enrolled in a four year college or university than were similar MPS students. MPCP students persisted in college through their first year at a rate six percentage points (6%) higher than similar MPS students. The MPCP advantage on this important metric – educational attainment – represents almost a 20% gain in the likelihood of a MPCP participant's college enrollment over an MPS counterpart. Educational attainment is an important student outcome because a number of studies have connected higher levels of attainment with a variety of quality-of-life indicators including greater longevity, higher lifetime earnings, and a lower likelihood of incarceration.

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APPENDIX D: Best and Worst Case Economic Projections

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Life Cycle Budget and EVA With Investment

	ADM Growth Rate	Inflation Rate	NPV Investment				Required Budget delta 2015 ($M)			$ 3,050.00
	1.8%	2.40%	1,260							
Year	Discount Factor	Base Budget (Millions)	Addl. Invest. Amort. $M	Projected Budget	Average Daily Membership	Per Pupil Expendi-ture	VA NAEP (No Invest)	VA NAEP w/ Invest	MN NAEP (No Invest)	NAEP Point Value by Year $M
2015	0.000	14,680	$ -	14,680	1.274	$ 11,523	288.33	288.33	294.15	$ 524.56
2016	97.66%	$ 15,300	$ 143	15,443	1.297	$ 11,910	289.64	289.91	294.87	$ 537.15
2017	95.37%	$ 16,094	$ 143	16,237	1.320	$ 12,304	290.67	291.20	295.59	$ 550.04
2018	93.13%	$ 16,922	$ 143	17,066	1.343	$ 12,706	291.71	292.49	296.31	$ 563.24
2019	90.95%	$ 17,786	$ 143	17,929	1.367	$ 13,116	292.74	293.77	297.03	$ 576.76
2020	88.82%	$ 18,685	$ 143	18,828	1.391	$ 13,534	293.78	295.05	297.75	$ 590.60
2021	86.74%	$ 19,623	$ 143	19,766	1.416	$ 13,960	294.81	296.32	298.47	$ 604.77
2022	84.70%	$ 20,600	$ 143	20,743	1.441	$ 14,394	295.84	297.58	299.19	$ 619.29
2023	82.72%	$ 21,618	$ 143	21,761	1.467	$ 14,837	296.88	298.84	299.91	$ 634.15
2024	80.78%	$ 22,679	$ 143	22,822	1.493	$ 15,289	297.91	300.10	300.63	$ 649.37
2025	78.89%	$ 23,785	$ 143	23,928	1.519	$ 15,750	298.95	301.35	301.35	$ 664.95
2026	77.04%	$ 24,938		24,938	1.546	$ 16,128	299.77	302.17	302.07	$ 680.91
2027	75.23%	$ 25,990		25,990	1.574	$ 16,515	300.81	303.21	302.79	$ 697.25
2028	73.47%	$ 27,086		27,086	1.602	$ 16,912	301.85	304.25	303.51	$ 713.99
2029	71.75%	$ 28,229		28,229	1.630	$ 17,318	302.89	305.29	304.23	$ 731.12
2030	70.06%	$ 29,420		29,420	1.659	$ 17,733	303.93	306.33	304.95	$ 748.67
2031	68.42%	$ 30,661		30,661	1.688	$ 18,159	304.97	307.37	305.67	$ 766.64
2032	66.82%	$ 31,954		31,954	1.718	$ 18,595	306.01	308.41	306.39	$ 785.04
2033	65.25%	$ 33,302		33,302	1.749	$ 19,041	307.05	309.45	307.11	$ 803.88
2034	63.72%	$ 34,707		34,707	1.780	$ 19,498	308.09	310.49	307.83	$ 823.17
2035	62.23%	$ 36,171		36,171	1.812	$ 19,966	309.13	311.53	308.55	$ 842.93

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Life Cycle Benefits and Costs With Investment

	Proj. PCESA Enrollment		Fiscal Performance without PCESA				Fiscal Performance with PCESA									EVA w/ Investment		EVA w/o Investment	
Year	EISD	Virginia Private & HS Est. (% PS ADM)	Ladner Projected PS ADM (million)	PS PPE ($)	Budget w/o PCESA ($M)	Budget w/o PCESA (2015 $M)	PCESA ADM (million)	LSD Savings ($M)	State Savings $M	Annual PCESA Savings $M	Adj. PS ADM (after PCESA)	Adj. PS Budget ($M)	Adj. PS Budget (2015 $M)	Savings (LSD & State) (%)	PCESA Savings (2015 $M)	EVA Added Best Case (2015 $M)	EVA Added Worst Case (2015 $M)	EVA Added Best Case (2015 $M)	EVA Added Worst Case (2015 $M)
2016	5.10%	3.66%	1.297	$ 11,910	$ 15,443	$ 15,081	0.047	$ 116.59	$ 80	$ 196	1.249	$ 15,247	$ 14,889	1.3%	$ 192	$ 46,531	$ 26,224	$ -	$ -
2017	6.00%	7.19%	1.320	$ 12,304	$ 16,237	$ 15,485	0.095	$ 241	$ 165	$ 406	1.225	$ 15,832	$ 15,098	2.5%	$ 387	$ 45,440	$ 25,610	$ -	$ -
2018	7.50%	9.26%	1.343	$ 12,706	$ 17,066	$ 15,894	0.124	$ 326	$ 223	$ 549	1.219	$ 16,517	$ 15,382	3.2%	$ 511	$ 44,375	$ 25,009	$ -	$ -
2019	10.50%	10.73%	1.367	$ 13,116	$ 17,929	$ 16,306	0.147	$ 397	$ 271	$ 668	1.220	$ 17,261	$ 15,699	3.7%	$ 608	$ 43,335	$ 24,423	$ -	$ -
2020	11.80%	11.87%	1.391	$ 13,534	$ 18,828	$ 16,723	0.165	$ 461	$ 315	$ 776	1.226	$ 18,052	$ 16,034	4.1%	$ 689	$ 42,320	$ 23,851	$ -	$ -
2021	12.80%	12.80%	1.416	$ 13,960	$ 19,766	$ 17,144	0.181	$ 522	$ 357	$ 878	1.235	$ 18,887	$ 16,382	4.4%	$ 762	$ 41,328	$ 23,292	$ -	$ -
2022		13.58%	1.441	$ 14,394	$ 20,743	$ 17,570	0.196	$ 581	$ 397	$ 979	1.245	$ 19,764	$ 16,741	4.7%	$ 829	$ 40,359	$ 22,746	$ -	$ -
2023		14.27%	1.467	$ 14,837	$ 21,761	$ 18,000	0.209	$ 640	$ 438	$ 1,078	1.257	$ 20,683	$ 17,109	5.0%	$ 892	$ 39,413	$ 22,213	$ -	$ -
2024		14.87%	1.493	$ 15,289	$ 22,822	$ 18,436	0.222	$ 700	$ 478	$ 1,178	1.271	$ 21,644	$ 17,484	5.2%	$ 952	$ 38,490	$ 21,692	$ -	$ -
2025		15.40%	1.519	$ 15,750	$ 23,928	$ 18,876	0.234	$ 760	$ 520	$ 1,280	1.285	$ 22,648	$ 17,866	5.3%	$ 1,010	$ 37,587	$ 21,184	$ -	$ -
2026		15.89%	1.546	$ 16,128	$ 24,938	$ 19,211	0.246	$ 817	$ 559	$ 1,376	1.301	$ 23,562	$ 18,151	5.5%	$ 1,060	$ 36,707	$ 20,687	$ -	$ -
2027		16.33%	1.574	$ 16,515	$ 25,990	$ 19,552	0.257	$ 876	$ 598	$ 1,474	1.317	$ 24,516	$ 18,443	5.7%	$ 1,109	$ 35,846	$ 20,202	$ -	$ -
2028		16.74%	1.602	$ 16,912	$ 27,086	$ 19,900	0.268	$ 935	$ 639	$ 1,575	1.333	$ 25,511	$ 18,743	5.8%	$ 1,157	$ 35,006	$ 19,729	$ -	$ -
2029		17.12%	1.630	$ 17,318	$ 28,229	$ 20,253	0.279	$ 997	$ 681	$ 1,678	1.351	$ 26,551	$ 19,049	5.9%	$ 1,204	$ 34,186	$ 19,267	$ -	$ -
2030		17.47%	1.659	$ 17,733	$ 29,420	$ 20,613	0.290	$ 1,060	$ 725	$ 1,785	1.369	$ 27,635	$ 19,362	6.1%	$ 1,251	$ 33,384	$ 18,815	$ -	$ -
2031		17.80%	1.688	$ 18,159	$ 30,661	$ 20,979	0.301	$ 1,126	$ 769	$ 1,895	1.388	$ 28,765	$ 19,682	6.2%	$ 1,297	$ 32,602	$ 18,374	$ -	$ -
2032		18.11%	1.718	$ 18,595	$ 31,954	$ 21,351	0.311	$ 1,194	$ 816	$ 2,010	1.407	$ 29,945	$ 20,009	6.3%	$ 1,343	$ 31,838	$ 17,943	$ -	$ -
2033		18.40%	1.749	$ 19,041	$ 33,302	$ 21,731	0.322	$ 1,264	$ 864	$ 2,128	1.427	$ 31,174	$ 20,342	6.4%	$ 1,389	$ 31,092	$ 17,523	$ -	$ -
2034		18.68%	1.780	$ 19,498	$ 34,707	$ 22,117	0.332	$ 1,337	$ 914	$ 2,251	1.448	$ 32,456	$ 20,682	6.5%	$ 1,434	$ 30,363	$ 17,112	$ -	$ -
2035		18.94%	1.812	$ 19,966	$ 36,171	$ 22,509	0.343	$ 1,413	$ 966	$ 2,379	1.469	$ 33,792	$ 21,029	6.6%	$ 1,480	$ 29,651	$ 16,711	$ -	$ -
10-year Totals					$ 194,523	$ 169,515				$ 7,988		$186,535	$162,684		$ 6,831	$419,180	$ 236,244	$ -	$ -
15-year Totals					$ 330,185	$ 269,044				$ 15,876		$314,309	$256,433		$ 12,611	$594,309	$ 334,944	$ -	$ -
18-year Totals					$ 426,102	$ 333,105				$ 21,909		$404,193	$316,466		$ 16,639	$689,840	$ 388,784	$ -	$ -

		With Investment		Without Investment	
		With PCESA	Without PCESA	With PCESA	Without PCESA
Best Case	Cumulative Benefits	$ 419,180	$ 419,180	$ -	$ -
	Cumulative Costs	$ 162,684	$ 169,515	$ -	$ -
	Return on Investment	157.7%	147.3%	NA	NA
Worst Case	Cumulative Benefits	$ 236,244	$ 236,244	$ -	$ -
	Cumulative Costs	$ 162,684	$ 169,515	$ -	$ -
	Return on Investment	45.2%	39.4%	NA	NA

Life Cycle Budget and EVA Without Investment

	ADM Growth Rate	Inflation Rate	NPV Investment				Required Budget delta 2015 ($M)			$ 3,050.00
	1.8%	2.40%	0							
Year	Discount Factor	Base Budget (Millions)	Addl. Invest. Amort. $M	Projected Budget	Average Daily Membership	Per Pupil Expendi-ture	VA NAEP (No Invest)	VA NAEP w/ Invest	MN NAEP (No Invest)	NAEP Point Value by Year $M
2015	0.000	14,680	$ -	14,680	1.274	$ 11,523	288.33	288.33	294.15	$ 524.56
2016	97.66%	$ 15,300	$ -	15,300	1.297	$ 11,800	289.37	289.37	294.87	$ 537.15
2017	95.37%	$ 15,945	$ -	15,945	1.320	$ 12,083	290.41	290.41	295.59	$ 550.04
2018	93.13%	$ 16,618	$ -	16,618	1.343	$ 12,373	291.45	291.45	296.31	$ 563.24
2019	90.95%	$ 17,319	$ -	17,319	1.367	$ 12,670	292.49	292.49	297.03	$ 576.76
2020	88.82%	$ 18,049	$ -	18,049	1.391	$ 12,974	293.53	293.53	297.75	$ 590.60
2021	86.74%	$ 18,811	$ -	18,811	1.416	$ 13,285	294.57	294.57	298.47	$ 604.77
2022	84.70%	$ 19,604	$ -	19,604	1.441	$ 13,604	295.61	295.61	299.19	$ 619.29
2023	82.72%	$ 20,431	$ -	20,431	1.467	$ 13,930	296.65	296.65	299.91	$ 634.15
2024	80.78%	$ 21,293	$ -	21,293	1.493	$ 14,265	297.69	297.69	300.63	$ 649.37
2025	78.89%	$ 22,191	$ -	22,191	1.519	$ 14,607	298.73	298.73	301.35	$ 664.95
2026	77.04%	$ 23,128		23,128	1.546	$ 14,958	299.77	299.77	302.07	$ 680.91
2027	75.23%	$ 24,103		24,103	1.574	$ 15,317	300.81	300.81	302.79	$ 697.25
2028	73.47%	$ 25,120		25,120	1.602	$ 15,684	301.85	301.85	303.51	$ 713.99
2029	71.75%	$ 26,180		26,180	1.630	$ 16,061	302.89	302.89	304.23	$ 731.12
2030	70.06%	$ 27,284		27,284	1.659	$ 16,446	303.93	303.93	304.95	$ 748.67
2031	68.42%	$ 28,435		28,435	1.688	$ 16,841	304.97	304.97	305.67	$ 766.64
2032	66.82%	$ 29,635		29,635	1.718	$ 17,245	306.01	306.01	306.39	$ 785.04
2033	65.25%	$ 30,885		30,885	1.749	$ 17,659	307.05	307.05	307.11	$ 803.88
2034	63.72%	$ 32,188		32,188	1.780	$ 18,083	308.09	308.09	307.83	$ 823.17
2035	62.23%	$ 33,546		33,546	1.812	$ 18,517	309.13	309.13	308.55	$ 842.93

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Life Cycle Benefits and Costs Without Investment

	Proj. PCESA Enrollment		Fiscal Performance without PCESA				Fiscal Performance with PCESA									EVA w/ Investment		EVA w/o Investment	
Year	EISD	Virginia Private & HS Est. (% PS ADM)	Ladner Projected PS ADM (million)	PS PPE ($)	Budget w/o PCESA ($M)	Budget w/o PCESA (2015 $M)	PCESA ADM (million)	LSD Savings ($M)	State Savings $M	Annual PCESA Savings $M	Adj. PS ADM (after PCESA)	Adj. PS Budget ($M)	Adj. PS Budget (2015 $M)	Savings (LSD & State) (%)	PCESA Savings (2015 $M)	EVA Added Best Case (2015 $M)	EVA Added Worst Case (2015 $M)	EVA Added Best Case (2015 $M)	EVA Added Worst Case (2015 $M)
2016	5.10%	3.66%	1.297	$ 11,800	$ 15,300	$ 14,941	0.047	$ 115.51	$ 79	$ 194	1.249	$ 15,105	$ 14,751	1.3%	$ 190	$ -	$ -	$ 35,699	$ 20,145
2017	6.00%	7.19%	1.320	$ 12,083	$ 15,945	$ 15,206	0.095	$ 237	$ 162	$ 398	1.225	$ 15,547	$ 14,826	2.5%	$ 380	$ -	$ -	$ 34,862	$ 19,673
2018	7.50%	9.26%	1.343	$ 12,373	$ 16,618	$ 15,476	0.124	$ 318	$ 217	$ 535	1.219	$ 16,083	$ 14,979	3.2%	$ 498	$ -	$ -	$ 34,045	$ 19,212
2019	10.50%	10.73%	1.367	$ 12,670	$ 17,319	$ 15,751	0.147	$ 383	$ 262	$ 645	1.220	$ 16,673	$ 15,164	3.7%	$ 587	$ -	$ -	$ 33,247	$ 18,762
2020	11.80%	11.87%	1.391	$ 12,974	$ 18,049	$ 16,031	0.165	$ 442	$ 302	$ 744	1.226	$ 17,305	$ 15,370	4.1%	$ 661	$ -	$ -	$ 32,468	$ 18,322
2021	12.80%	12.80%	1.416	$ 13,285	$ 18,811	$ 16,316	0.181	$ 497	$ 339	$ 836	1.235	$ 17,975	$ 15,591	4.4%	$ 725	$ -	$ -	$ 31,707	$ 17,892
2022		13.58%	1.441	$ 13,604	$ 19,604	$ 16,605	0.196	$ 549	$ 375	$ 925	1.245	$ 18,679	$ 15,822	4.7%	$ 783	$ -	$ -	$ 30,964	$ 17,473
2023		14.27%	1.467	$ 13,930	$ 20,431	$ 16,900	0.209	$ 601	$ 411	$ 1,012	1.257	$ 19,419	$ 16,063	5.0%	$ 837	$ -	$ -	$ 30,238	$ 17,064
2024		14.87%	1.493	$ 14,265	$ 21,293	$ 17,201	0.222	$ 653	$ 446	$ 1,099	1.271	$ 20,194	$ 16,313	5.2%	$ 888	$ -	$ -	$ 29,529	$ 16,664
2025		15.40%	1.519	$ 14,607	$ 22,191	$ 17,506	0.234	$ 705	$ 482	$ 1,187	1.285	$ 21,004	$ 16,570	5.3%	$ 936	$ -	$ -	$ 28,837	$ 16,273
2026		15.89%	1.546	$ 14,958	$ 23,128	$ 17,817	0.246	$ 758	$ 518	$ 1,276	1.301	$ 21,851	$ 16,834	5.5%	$ 983	$ -	$ -	$ 28,161	$ 15,892
2027		16.33%	1.574	$ 15,317	$ 24,103	$ 18,133	0.257	$ 812	$ 555	$ 1,367	1.317	$ 22,736	$ 17,105	5.7%	$ 1,029	$ -	$ -	$ 27,501	$ 15,519
2028		16.74%	1.602	$ 15,684	$ 25,120	$ 18,455	0.268	$ 867	$ 593	$ 1,460	1.333	$ 23,660	$ 17,382	5.8%	$ 1,073	$ -	$ -	$ 26,857	$ 15,156
2029		17.12%	1.630	$ 16,061	$ 26,180	$ 18,783	0.279	$ 924	$ 632	$ 1,556	1.351	$ 24,623	$ 17,666	5.9%	$ 1,117	$ -	$ -	$ 26,227	$ 14,800
2030		17.47%	1.659	$ 16,446	$ 27,284	$ 19,117	0.290	$ 983	$ 672	$ 1,655	1.369	$ 25,629	$ 17,957	6.1%	$ 1,160	$ -	$ -	$ 25,612	$ 14,453
2031		17.80%	1.688	$ 16,841	$ 28,435	$ 19,456	0.301	$ 1,044	$ 714	$ 1,758	1.388	$ 26,678	$ 18,253	6.2%	$ 1,203	$ -	$ -	$ 25,012	$ 14,115
2032		18.11%	1.718	$ 17,245	$ 29,635	$ 19,802	0.311	$ 1,107	$ 757	$ 1,864	1.407	$ 27,771	$ 18,556	6.3%	$ 1,245	$ -	$ -	$ 24,426	$ 13,784
2033		18.40%	1.749	$ 17,659	$ 30,885	$ 20,153	0.322	$ 1,172	$ 801	$ 1,974	1.427	$ 28,911	$ 18,866	6.4%	$ 1,288	$ -	$ -	$ 23,853	$ 13,461
2034		18.68%	1.780	$ 18,083	$ 32,188	$ 20,511	0.332	$ 1,240	$ 848	$ 2,088	1.448	$ 30,100	$ 19,181	6.5%	$ 1,330	$ -	$ -	$ 23,294	$ 13,145
2035		18.94%	1.812	$ 18,517	$ 33,546	$ 20,876	0.343	$ 1,310	$ 896	$ 2,206	1.469	$ 31,340	$ 19,503	6.6%	$ 1,373	$ -	$ -	$ 22,748	$ 12,837
10-year Totals					$ 185,561	$ 161,934				$ 7,576		$177,985	$155,449		$ 6,485	$ -	$ -	$ 321,594	$ 181,479
15-year Totals					$ 311,376	$ 254,239				$ 14,891		$296,485	$242,393		$ 11,846	$ -	$ -	$ 455,953	$ 257,300
18-year Totals					$ 400,331	$ 313,651				$ 20,486		$379,845	$298,068		$ 15,582	$ -	$ -	$ 529,245	$ 298,659

		With Investment		Without Investment	
		With PCESA	Without PCESA	With PCESA	Without PCESA
Best Case	Cumulative Benefits	$ -	$ -	$529,245	$529,245
	Cumulative Costs	$ -	$ -	$298,068	$313,651
	Return on Investment	NA	NA	77.6%	68.7%
Worst Case	Cumulative Benefits	$ -	$ -	$298,659	$298,659
	Cumulative Costs	$ -	$ -	$298,068	$313,651
	Return on Investment	NA	NA	0.2%	-4.8%

APPENDIX E: Best and Worst Case Fiscal Impact Projections

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Impact of Parental Choice Education Savings Accounts on Rural Virginia Counties

LOCALITY IMPACT: NO ADDITIONAL INVESTMENT, 18-YEARS TO PARITY WITH MN, NO NAEP PRIVATE SCHOOL ADVANTAGE, HANUSHEK WORST CASE SCENARIO

Local School Districts				Virginia SOL Test Scores					Economic Projections				PCESA Enrollment Projections				Savings w/o Transfers	
ID	Division ID	Division Name	Class	SOL 2011	SOL 2012	SOL 2013	SOL 2014	SOL 2015	Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)	Home School Only	New Private	New Home School	Total New Enrollment	LSD Savings beyond Fixed Cost	VDOE Savings Beyond Guarantee
89	1	Accomack County	R	82	64	59	66	74	$ 2,293.98	9.9%	$ 5,297.56	9.1%	-	207	32	239	$207,488	$492,009
53	3	Alleghany County	R	94	62	67	76	78	$ 2,684.78	11.0%	$ 6,351.66	10.6%	-	111	22	133	$83,322	$263,684
5	9	Bath County	R	67	36	51	79	65	$ 1,773.66	5.5%	$ 3,626.24	6.4%	2	0	0	2	$15,605	$1,548
99	10	Bedford County	R	68	28	35	54	60	$ 1,528.62	5.4%	$ 3,912.39	5.6%	-	425	84	509	$124,466	$727,160
8	11	Bland County	R	74	41	37	39	50	$ 1,487.79	7.8%	$ 3,793.26	7.6%	8	0	0	8	$5,594	$12,380
32	13	Brunswick County	R	82	44	35	46	69	$ 1,509.42	8.4%	$ 4,320.32	8.6%	-	84	11	95	$0	$208,506
52	14	Buchanan County	R	80	44	48	45	60	$ 1,816.68	9.9%	$ 4,476.41	8.8%	-	126	25	151	$258,938	$280,964
11	103	Buena Vista City	R	82	27	43	32	31	$ 1,759.37	10.1%	$ 4,225.44	9.1%	9	0	0	9	$0	$17,065
65	18	Carroll County	R	81	58	34	67	70	$ 1,827.37	9.2%	$ 4,330.44	9.4%	-	169	33	202	$131,713	$402,678
45	20	Charlotte County	R	88	64	69	83	91	$ 2,856.83	15.2%	$ 7,421.29	16.4%	15	0	0	15	$0	$47,191
16	25	Cumberland County	R	79	40	31	20	53	$ 1,633.92	7.1%	$ 3,981.22	7.2%	-	62	11	73	$0	$151,498
47	26	Dickenson County	R	78	58	56	70	79	$ 2,305.41	12.8%	$ 5,691.39	11.7%	22	0	0	22	$0	$39,671
28	28	Essex County	R	84	44	54	46	77	$ 2,122.05	9.8%	$ 5,485.27	10.6%	-	61	14	75	$110,494	$138,580
18	135	Franklin City	R	75	52	42	56	62	$ 1,815.00	9.2%	$ 4,270.31	10.1%	-	49	6	55	$51,408	$171,927
105	33	Franklin County	R	87	78	83	84	81	$ 2,298.75	9.3%	$ 5,560.28	9.4%	-	274	54	328	$443,721	$589,000
1	111	Galax City	R	79	68	53	60	69	$ 2,707.97	13.5%	$ 6,306.42	14.8%	-	56	9	65	$0	$118,704
29	38	Grayson County	R	84	43	53	41	52	$ 1,521.74	8.1%	$ 3,641.38	8.0%	-	83	16	99	$46,735	$206,746
44	40	Greensville County	R	72	51	45	60	50	$ 1,696.60	11.3%	$ 8,727.25	15.6%	-	115	16	131	$0	$213,788
79	41	Halifax County	R	75	43	54	41	59	$ 2,085.33	10.5%	$ 5,075.43	10.1%	-	231	36	267	$0	$579,416
93	44	Henry County	R	91	50	54	28	65	$ 2,068.69	10.6%	$ 4,801.01	10.3%	-	321	56	377	$0	$574,780
2	45	Highland County	R	26	20	27	30	26	$ 518.50	1.9%	$ 1,093.85	2.0%	1	0	0	1	$4,834	$4,995
17	49	King and Queen Count	R	92	68	72	63	79	$ 1,953.92	7.7%	$ 4,941.38	8.3%	6	0	0	6	$5,966	$12,367
84	48	King George County	R	90	79	61	67	82	$ 2,721.11	7.8%	$ 8,289.65	8.6%	31	0	0	31	$39,696	$36,733
6	51	Lancaster County	R	50	18	9	33	47	$ 857.39	2.8%	$ 1,785.71	3.0%	-	25	4	29	$151,952	$20,828
61	52	Lee County	R	90	46	50	66	69	$ 1,981.67	11.8%	$ 5,144.24	12.0%	-	166	35	201	$0	$241,420
10	137	Lexington City	R	82	56	67	61	70	$ 1,407.11	9.0%	$ 5,824.81	10.5%	-	23	4	27	$79,888	$30,499
86	54	Louisa County	R	84	46	61	78	79	$ 2,156.33	7.8%	$ 5,775.34	8.4%	-	147	27	174	$109,922	$209,261
27	55	Lunenburg County	R	85	45	51	47	52	$ 1,667.35	9.0%	$ 4,483.93	9.0%	12	0	0	12	$0	$21,787
26	56	Madison County	R	57	23	36	47	78	$ 1,680.99	6.4%	$ 4,330.70	6.9%	-	68	14	82	$33,667	$115,789
54	58	Mecklenburg County	R	76	26	25	17	52	$ 1,592.57	7.7%	$ 3,853.77	7.7%	-	182	29	211	$172,362	$390,873
24	59	Middlesex County	R	87	57	68	45	64	$ 1,746.70	5.7%	$ 4,185.86	6.4%	-	28	5	33	$107,403	($11,758)
25	65	Northampton County	R	75	36	35	55	47	$ 1,515.52	6.5%	$ 3,497.25	5.9%	-	58	8	66	$79,077	$132,570
22	66	Northumberland Count	R	79	42	37	62	47	$ 1,333.67	4.5%	$ 2,882.37	4.9%	6	0	0	6	$26,330	$4,705
9	119	Norton City	R	83	31	19	50	69	$ 2,559.51	11.3%	$ 6,221.71	13.1%	6	0	0	6	$0	$9,474
39	67	Nottoway County	R	71	35	53	62	54	$ 1,824.43	9.5%	$ 5,033.35	9.9%	-	101	16	117	$0	$167,097
88	68	Orange County	R	79	58	59	68	74	$ 2,186.75	7.6%	$ 6,152.02	8.5%	-	204	38	242	$179,216	$314,352
67	69	Page County	R	58	58	71	76	82	$ 2,205.82	10.0%	$ 5,521.51	10.3%	-	149	30	179	$0	$267,242
35	70	Patrick County	R	90	23	6	30	57	$ 1,572.67	8.3%	$ 3,732.78	8.1%	-	130	25	155	$0	$205,740
106	71	Pittsylvania County	R	89	51	52	71	71	$ 2,176.36	10.1%	$ 5,229.65	10.1%	-	407	75	482	$0	$752,704
36	73	Prince Edward County	R	82	45	42	47	60	$ 1,273.45	7.2%	$ 3,856.18	7.4%	-	92	14	106	$65,899	$231,056
31	79	Richmond County	R	98	78	72	82	70	$ 2,274.48	11.4%	$ 7,206.05	11.6%	9	0	0	9	$12,256	$17,528
57	81	Rockbridge County	R	90	73	54	77	83	$ 1,828.14	6.9%	$ 4,443.72	7.6%	20	0	0	20	$30,160	$27,549
46	83	Russell County	R	67	21	27	28	46	$ 1,465.46	7.3%	$ 3,719.36	6.6%	-	183	38	221	$0	$309,074
94	85	Shenandoah County	R	89	58	75	70	67	$ 2,316.81	9.3%	$ 5,764.89	9.7%	-	241	46	287	$535,366	$438,640
74	86	Smyth County	R	85	45	48	55	58	$ 2,008.56	9.1%	$ 4,934.19	8.7%	-	211	44	255	$0	$487,597
58	87	Southampton County	R	88	70	64	69	78	$ 2,479.35	10.6%	$ 6,806.46	11.5%	-	122	21	143	$2,485	$285,861
23	90	Surry County	R	97	79	83	82	90	$ 2,480.89	10.1%	$ 6,364.99	11.4%	3	0	0	3	$24,385	$1,868
98	92	Tazewell County	R	88	72	68	74	79	$ 2,404.50	11.2%	$ 5,705.33	10.2%	-	263	54	317	$0	$594,725
33	95	Westmoreland County	R	85	61	61	56	73	$ 1,461.17	5.7%	$ 3,654.92	6.8%	11	0	0	11	$7,707	$17,409
102	96	Wise County	R	86	85	82	91	94	$ 2,837.59	14.2%	$ 7,306.00	12.8%	-	256	52	308	$0	$520,578
66	97	Wythe County	R	74	36	40	61	72	$ 1,923.98	8.3%	$ 4,665.47	8.3%	-	175	34	209	$35,161	$373,789

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LOCALITY IMPACT: NO ADDITIONAL INVESTMENT, 18-YEARS TO PARITY WITH MN, NO POINT NAEP PRIVATE SCHOOL ADVANTAGE, HANUSHEK BEST CASE SCENARIO

Local School Districts				Virginia SOL Test Scores					Economic Projections				PCESA Enrollment Projections				Savings w/o Transfers	
ID	Division ID	Division Name	Class	SOL 2011	SOL 2012	SOL 2013	SOL 2014	SOL 2015	Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)	Home School Only	New Private	New Home School	Total New Enrollment	LSD Savings beyond Fixed Cost	VDOE Savings Beyond Guarantee
89	1	Accomack County	R	82	64	59	66	74	$ 4,065.10	17.5%	$ 9,387.65	16.2%	-	207	32	239	$207,488	$492,009
53	3	Alleghany County	R	94	62	67	76	78	$ 4,757.62	19.5%	$ 11,255.59	18.8%	-	111	22	133	$83,322	$263,684
5	9	Bath County	R	67	36	51	79	65	$ 3,143.05	9.7%	$ 6,425.96	11.4%	2	0	0	2	$15,605	$1,548
99	10	Bedford County	R	68	28	35	54	60	$ 2,708.82	9.5%	$ 6,933.03	9.9%	-	425	84	509	$124,466	$727,160
8	11	Bland County	R	74	41	37	39	50	$ 2,636.47	13.8%	$ 6,721.93	13.4%	8	0	0	8	$5,594	$12,380
32	13	Brunswick County	R	82	44	35	46	69	$ 2,674.80	14.9%	$ 7,655.91	15.2%	-	84	11	95	$0	$208,506
52	14	Buchanan County	R	80	44	48	45	60	$ 3,219.28	17.5%	$ 7,932.52	15.6%	-	126	25	151	$258,938	$280,964
11	103	Buena Vista City	R	82	27	43	32	31	$ 3,117.73	17.9%	$ 7,487.77	16.1%	9	0	0	9	$0	$17,065
65	18	Carroll County	R	81	58	34	67	70	$ 3,238.23	16.4%	$ 7,673.84	16.7%	-	169	33	202	$131,713	$402,678
45	20	Charlotte County	R	88	64	69	83	91	$ 5,062.50	27.0%	$ 13,151.05	29.0%	15	0	0	15	$0	$47,191
16	25	Cumberland County	R	79	40	31	20	53	$ 2,895.43	12.6%	$ 7,055.00	12.8%	-	62	11	73	$0	$151,498
47	26	Dickenson County	R	78	58	56	70	79	$ 4,085.35	22.8%	$ 10,085.55	20.7%	22	0	0	22	$0	$39,671
28	28	Essex County	R	84	44	54	46	77	$ 3,760.43	17.4%	$ 9,720.29	18.8%	-	61	14	75	$110,494	$138,580
18	135	Franklin City	R	75	52	42	56	62	$ 3,216.30	16.3%	$ 7,567.30	18.0%	-	49	6	55	$51,408	$171,927
105	33	Franklin County	R	87	78	83	84	81	$ 4,073.54	16.4%	$ 9,853.21	16.6%	-	274	54	328	$443,721	$589,000
1	111	Galax City	R	79	68	53	60	69	$ 4,798.71	23.9%	$ 11,175.42	26.1%	-	56	9	65	$0	$118,704
29	38	Grayson County	R	84	43	53	41	52	$ 2,696.62	14.4%	$ 6,452.78	14.2%	-	83	16	99	$46,735	$206,746
44	40	Greensville County	R	72	51	45	60	50	$ 3,006.50	20.1%	$ 15,465.30	27.7%	-	115	16	131	$0	$213,788
79	41	Halifax County	R	75	43	54	41	59	$ 3,695.36	18.7%	$ 8,994.03	17.9%	-	231	36	267	$0	$579,416
93	44	Henry County	R	91	50	54	28	65	$ 3,665.86	18.8%	$ 8,507.73	18.3%	-	321	56	377	$0	$574,780
2	45	Highland County	R	26	20	27	30	26	$ 918.81	3.4%	$ 1,938.37	3.6%	1	0	0	1	$4,834	$4,995
17	49	King and Queen Count	R	92	68	72	63	79	$ 3,462.49	13.6%	$ 8,756.48	14.7%	6	0	0	6	$5,966	$12,367
84	48	King George County	R	90	79	61	67	82	$ 4,822.00	13.8%	$ 14,689.84	15.3%	31	0	0	31	$39,696	$36,733
6	51	Lancaster County	R	50	18	9	33	47	$ 1,519.36	4.9%	$ 3,164.41	5.3%	-	25	4	29	$151,952	$20,828
61	52	Lee County	R	90	46	50	66	69	$ 3,511.65	20.9%	$ 9,115.95	21.3%	-	166	35	201	$0	$241,420
10	137	Lexington City	R	82	56	67	61	70	$ 2,493.50	16.0%	$ 10,321.98	18.6%	-	23	4	27	$79,888	$30,499
86	54	Louisa County	R	84	46	61	78	79	$ 3,821.16	13.9%	$ 10,234.30	15.0%	-	147	27	174	$109,922	$209,261
27	55	Lunenburg County	R	85	45	51	47	52	$ 2,954.67	15.9%	$ 7,945.85	16.0%	12	0	0	12	$0	$21,787
26	56	Madison County	R	57	23	36	47	78	$ 2,978.83	11.4%	$ 7,674.31	12.2%	-	68	14	82	$33,667	$115,789
54	58	Mecklenburg County	R	76	26	25	17	52	$ 2,822.14	13.6%	$ 6,829.16	13.6%	-	182	29	211	$172,362	$390,873
24	59	Middlesex County	R	87	57	68	45	64	$ 3,095.28	10.2%	$ 7,417.64	11.4%	-	28	5	33	$107,403	($11,758)
25	65	Northampton County	R	75	36	35	55	47	$ 2,685.61	11.5%	$ 6,197.37	10.5%	-	58	8	66	$79,077	$132,570
22	66	Northumberland Count	R	79	42	37	62	47	$ 2,363.36	8.0%	$ 5,107.77	8.7%	6	0	0	6	$26,330	$4,705
9	119	Norton City	R	83	31	19	50	69	$ 4,535.64	20.0%	$ 11,025.31	23.2%	6	0	0	6	$0	$9,474
39	67	Nottoway County	R	71	35	53	62	54	$ 3,233.02	16.8%	$ 8,919.45	17.6%	-	101	16	117	$0	$167,097
88	68	Orange County	R	79	58	59	68	74	$ 3,875.07	13.4%	$ 10,901.82	15.1%	-	204	38	242	$179,216	$314,352
67	69	Page County	R	58	58	71	76	82	$ 3,908.88	17.7%	$ 9,784.50	18.3%	-	149	30	179	$0	$267,242
35	70	Patrick County	R	90	23	6	30	57	$ 2,786.87	14.7%	$ 6,614.74	14.4%	-	130	25	155	$0	$205,740
106	71	Pittsylvania County	R	89	51	52	71	71	$ 3,856.66	17.8%	$ 9,267.30	17.9%	-	407	75	482	$0	$752,704
36	73	Prince Edward County	R	82	45	42	47	60	$ 2,256.64	12.7%	$ 6,833.42	13.1%	-	92	14	106	$65,899	$231,056
31	79	Richmond County	R	98	78	72	82	70	$ 4,030.55	20.2%	$ 12,769.64	20.6%	9	0	0	9	$12,256	$17,528
57	81	Rockbridge County	R	90	73	54	77	83	$ 3,239.59	12.3%	$ 7,874.59	13.5%	20	0	0	20	$30,160	$27,549
46	83	Russell County	R	67	21	27	28	46	$ 2,596.90	12.9%	$ 6,590.96	11.6%	-	183	38	221	$0	$309,074
94	85	Shenandoah County	R	89	58	75	70	67	$ 4,105.55	16.4%	$ 10,215.80	17.3%	-	241	46	287	$535,366	$438,640
74	86	Smyth County	R	85	45	48	55	58	$ 3,559.31	16.2%	$ 8,743.73	15.4%	-	211	44	255	$0	$487,597
58	87	Southampton County	R	88	70	64	69	78	$ 4,393.58	18.8%	$ 12,061.53	20.3%	-	122	21	143	$2,485	$285,861
23	90	Surry County	R	97	79	83	82	90	$ 4,396.31	18.0%	$ 11,279.22	20.2%	3	0	0	3	$24,385	$1,868
98	92	Tazewell County	R	88	72	68	74	79	$ 4,260.94	19.8%	$ 10,110.24	18.1%	-	263	54	317	$0	$594,725
33	95	Westmoreland County	R	85	61	61	56	73	$ 2,589.30	10.1%	$ 6,476.77	12.0%	11	0	0	11	$7,707	$17,409
102	96	Wise County	R	86	85	82	91	94	$ 5,028.40	25.2%	$ 12,946.75	22.7%	-	256	52	308	$0	$520,578
66	97	Wythe County	R	74	36	40	61	72	$ 3,409.43	14.7%	$ 8,267.54	14.7%	-	175	34	209	$35,161	$373,789

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Impact of Parental Choice Education Savings Accounts on Rural Virginia Counties

LOCALITY IMPACT: $143 ADDITIONAL INVESTMENT PER YEAR, 10 YEARS, 10-YEARS TO PARITY WITH MN, NO POINT NAEP PRIVATE SCHOOL ADVANTAGE, HANUSHEK WORST CASE SCENARIO

Local School Districts				Virginia SOL Test Scores					Economic Projections				PCESA Enrollment Projections				Savings w/o Transfers	
ID	Division ID	Division Name	Class	SOL 2011	SOL 2012	SOL 2013	SOL 2014	SOL 2015	Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)	Home School Only	New Private	New Home School	Total New Enrollment	LSD Savings beyond Fixed Cost	VDOE Savings Beyond Guarantee
89	1	Accomack County	R	82	64	59	66	74	$ 2,939.56	12.7%	$ 6,788.41	11.7%	-	207	32	239	$207,488	$492,009
53	3	Alleghany County	R	94	62	67	76	78	$ 3,427.32	14.0%	$ 8,108.36	13.5%	-	111	22	133	$83,322	$263,684
5	9	Bath County	R	67	36	51	79	65	$ 2,372.05	7.4%	$ 4,849.64	8.6%	2	0	0	2	$15,605	$1,548
99	10	Bedford County	R	68	28	35	54	60	$ 2,114.84	7.4%	$ 5,412.78	7.7%	-	425	84	509	$124,466	$727,160
8	11	Bland County	R	74	41	37	39	50	$ 2,066.15	10.9%	$ 5,267.86	10.5%	8	0	0	8	$5,594	$12,380
32	13	Brunswick County	R	82	44	35	46	69	$ 2,009.51	11.2%	$ 5,751.68	11.4%	-	84	11	95	$0	$208,506
52	14	Buchanan County	R	80	44	48	45	60	$ 2,411.41	13.1%	$ 5,941.88	11.7%	-	126	25	151	$258,938	$280,964
11	103	Buena Vista City	R	82	27	43	32	31	$ 2,467.40	14.1%	$ 5,925.91	12.8%	9	0	0	9	$0	$17,065
65	18	Carroll County	R	81	58	34	67	70	$ 2,436.45	12.3%	$ 5,773.81	12.6%	-	169	33	202	$131,713	$402,678
45	20	Charlotte County	R	88	64	69	83	91	$ 3,646.95	19.4%	$ 9,473.83	20.9%	15	0	0	15	$0	$47,191
16	25	Cumberland County	R	79	40	31	20	53	$ 2,260.53	9.9%	$ 5,508.01	10.0%	-	62	11	73	$0	$151,498
47	26	Dickenson County	R	78	58	56	70	79	$ 2,961.13	16.5%	$ 7,310.17	15.0%	22	0	0	22	$0	$39,671
28	28	Essex County	R	84	44	54	46	77	$ 2,719.24	12.6%	$ 7,028.94	13.6%	-	61	14	75	$110,494	$138,580
18	135	Franklin City	R	75	52	42	56	62	$ 2,442.58	12.4%	$ 5,746.87	13.7%	-	49	6	55	$51,408	$171,927
105	33	Franklin County	R	87	78	83	84	81	$ 2,934.52	11.8%	$ 7,098.11	11.9%	-	274	54	328	$443,721	$589,000
1	111	Galax City	R	79	68	53	60	69	$ 3,530.40	17.6%	$ 8,221.73	19.2%	-	56	9	65	$0	$118,704
29	38	Grayson County	R	84	43	53	41	52	$ 2,016.97	10.8%	$ 4,826.42	10.6%	-	83	16	99	$46,735	$206,746
44	40	Greensville County	R	72	51	45	60	50	$ 2,330.10	15.5%	$ 11,985.91	21.5%	-	115	16	131	$0	$213,788
79	41	Halifax County	R	75	43	54	41	59	$ 2,768.02	14.0%	$ 6,737.00	13.4%	-	231	36	267	$0	$579,416
93	44	Henry County	R	91	50	54	28	65	$ 2,666.62	13.6%	$ 6,188.70	13.3%	-	321	56	377	$0	$574,780
2	45	Highland County	R	26	20	27	30	26	$ 950.02	3.5%	$ 2,004.21	3.7%	1	0	0	1	$4,834	$4,995
17	49	King and Queen Count	R	92	68	72	63	79	$ 2,494.33	9.8%	$ 6,308.04	10.6%	6	0	0	6	$5,966	$12,367
84	48	King George County	R	90	79	61	67	82	$ 3,473.70	9.9%	$ 10,582.34	11.0%	31	0	0	31	$39,696	$36,733
6	51	Lancaster County	R	50	18	9	33	47	$ 1,380.79	4.5%	$ 2,875.79	4.8%	-	25	4	29	$151,952	$20,828
61	52	Lee County	R	90	46	50	66	69	$ 2,557.55	15.3%	$ 6,639.19	15.5%	-	166	35	201	$0	$241,420
10	137	Lexington City	R	82	56	67	61	70	$ 1,796.28	11.5%	$ 7,435.80	13.4%	-	23	4	27	$79,888	$30,499
86	54	Louisa County	R	84	46	61	78	79	$ 2,752.71	10.0%	$ 7,372.64	10.8%	-	147	27	174	$109,922	$209,261
27	55	Lunenburg County	R	85	45	51	47	52	$ 2,213.20	11.9%	$ 5,951.86	12.0%	12	0	0	12	$0	$21,787
26	56	Madison County	R	57	23	36	47	78	$ 2,292.45	8.8%	$ 5,906.01	9.4%	-	68	14	82	$33,667	$115,789
54	58	Mecklenburg County	R	76	26	25	17	52	$ 2,247.24	10.8%	$ 5,437.99	10.8%	-	182	29	211	$172,362	$390,873
24	59	Middlesex County	R	87	57	68	45	64	$ 2,229.80	7.3%	$ 5,343.56	8.2%	-	28	5	33	$107,403	($11,758)
25	65	Northampton County	R	75	36	35	55	47	$ 2,121.17	9.1%	$ 4,894.85	8.3%	-	58	8	66	$79,077	$132,570
22	66	Northumberland Count	R	79	42	37	62	47	$ 1,845.14	6.2%	$ 3,987.76	6.8%	6	0	0	6	$26,330	$4,705
9	119	Norton City	R	83	31	19	50	69	$ 3,490.55	15.4%	$ 8,484.87	17.8%	6	0	0	6	$0	$9,474
39	67	Nottoway County	R	71	35	53	62	54	$ 2,459.21	12.8%	$ 6,784.62	13.4%	-	101	16	117	$0	$167,097
88	68	Orange County	R	79	58	59	68	74	$ 2,812.05	9.7%	$ 7,911.19	10.9%	-	204	38	242	$179,216	$314,352
67	69	Page County	R	58	58	71	76	82	$ 2,839.97	12.9%	$ 7,108.87	13.3%	-	149	30	179	$0	$267,242
35	70	Patrick County	R	90	23	6	30	57	$ 2,219.16	11.7%	$ 5,267.26	11.5%	-	130	25	155	$0	$205,740
106	71	Pittsylvania County	R	89	51	52	71	71	$ 2,798.69	12.9%	$ 6,725.06	13.0%	-	407	75	482	$0	$752,704
36	73	Prince Edward County	R	82	45	42	47	60	$ 1,700.47	9.6%	$ 5,149.27	9.9%	-	92	14	106	$65,899	$231,056
31	79	Richmond County	R	98	78	72	82	70	$ 2,903.55	14.5%	$ 9,199.06	14.8%	9	0	0	9	$12,256	$17,528
57	81	Rockbridge County	R	90	73	54	77	83	$ 2,333.75	8.8%	$ 5,672.74	9.7%	20	0	0	20	$30,160	$27,549
46	83	Russell County	R	67	21	27	28	46	$ 2,129.07	10.6%	$ 5,403.61	9.5%	-	183	38	221	$0	$309,074
94	85	Shenandoah County	R	89	58	75	70	67	$ 2,957.58	11.8%	$ 7,359.31	12.4%	-	241	46	287	$535,366	$438,640
74	86	Smyth County	R	85	45	48	55	58	$ 2,654.57	12.1%	$ 6,521.16	11.5%	-	211	44	255	$0	$487,597
58	87	Southampton County	R	88	70	64	69	78	$ 3,165.07	13.5%	$ 8,688.95	14.6%	-	122	21	143	$2,485	$285,861
23	90	Surry County	R	97	79	83	82	90	$ 3,167.04	12.9%	$ 8,125.38	14.6%	3	0	0	3	$24,385	$1,868
98	92	Tazewell County	R	88	72	68	74	79	$ 3,069.52	14.2%	$ 7,283.27	13.0%	-	263	54	317	$0	$594,725
33	95	Westmoreland County	R	85	61	61	56	73	$ 1,865.29	7.3%	$ 4,665.77	8.6%	11	0	0	11	$7,707	$17,409
102	96	Wise County	R	86	85	82	91	94	$ 3,622.39	18.1%	$ 9,326.65	16.4%	-	256	52	308	$0	$520,578
66	97	Wythe County	R	74	36	40	61	72	$ 2,561.42	11.0%	$ 6,211.18	11.0%	-	175	34	209	$35,161	$373,789

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LOCALITY IMPACT: $143 ADDITIONAL INVESTMENT PER YEAR, 10 YEARS, 10-YEARS TO PARITY WITH MN, 6 POINT NAEP PRIVATE SCHOOL ADVANTAGE, HANUSHEK BEST CASE SCENARIO

Local School Districts				Virginia SOL Test Scores					Economic Projections				PCESA Enrollment Projections				Savings w/o Transfers	
ID	Division ID	Division Name	Class	SOL 2011	SOL 2012	SOL 2013	SOL 2014	SOL 2015	Delta Income / Person	Delta Income / Person (%)	Delta Income / Household	Delta Income / Household (%)	Home School Only	New Private	New Home School	Total New Enrollment	LSD Savings beyond Fixed Cost	VDOE Savings Beyond Guarantee
89	1	Accomack County	R	82	64	59	66	74	$ 5,204.90	22.4%	$ 12,019.82	20.8%	-	207	32	239	$207,488	$492,009
53	3	Alleghany County	R	94	62	67	76	78	$ 6,067.95	24.9%	$ 14,355.57	24.0%	-	111	22	133	$83,322	$263,684
5	9	Bath County	R	67	36	51	79	65	$ 4,198.90	13.0%	$ 8,584.63	15.2%	2	0	0	2	$15,605	$1,548
99	10	Bedford County	R	68	28	35	54	60	$ 3,745.74	13.1%	$ 9,586.94	13.7%	-	425	84	509	$124,466	$727,160
8	11	Bland County	R	74	41	37	39	50	$ 3,657.45	19.2%	$ 9,325.02	18.7%	8	0	0	8	$5,594	$12,380
32	13	Brunswick County	R	82	44	35	46	69	$ 3,557.55	19.9%	$ 10,182.55	20.2%	-	84	11	95	$0	$208,506
52	14	Buchanan County	R	80	44	48	45	60	$ 4,269.33	23.3%	$ 10,519.92	20.7%	-	126	25	151	$258,938	$280,964
11	103	Buena Vista City	R	82	27	43	32	31	$ 4,367.73	25.0%	$ 10,489.88	22.6%	9	0	0	9	$0	$17,065
65	18	Carroll County	R	81	58	34	67	70	$ 4,313.96	21.8%	$ 10,223.07	22.2%	-	169	33	202	$131,713	$402,678
45	20	Charlotte County	R	88	64	69	83	91	$ 6,455.79	34.4%	$ 16,770.46	37.0%	15	0	0	15	$0	$47,191
16	25	Cumberland County	R	79	40	31	20	53	$ 4,001.81	17.5%	$ 9,750.81	17.6%	-	62	11	73	$0	$151,498
47	26	Dickenson County	R	78	58	56	70	79	$ 5,241.80	29.2%	$ 12,940.49	26.6%	22	0	0	22	$0	$39,671
28	28	Essex County	R	84	44	54	46	77	$ 4,813.93	22.3%	$ 12,443.47	24.1%	-	61	14	75	$110,494	$138,580
18	135	Franklin City	R	75	52	42	56	62	$ 4,324.01	21.9%	$ 10,173.51	24.2%	-	49	6	55	$51,408	$171,927
105	33	Franklin County	R	87	78	83	84	81	$ 5,196.56	21.0%	$ 12,569.59	21.1%	-	274	54	328	$443,721	$589,000
1	111	Galax City	R	79	68	53	60	69	$ 6,249.81	31.1%	$ 14,554.81	34.0%	-	56	9	65	$0	$118,704
29	38	Grayson County	R	84	43	53	41	52	$ 3,570.77	19.0%	$ 8,544.53	18.8%	-	83	16	99	$46,735	$206,746
44	40	Greensville County	R	72	51	45	60	50	$ 4,125.23	27.5%	$ 21,219.99	38.0%	-	115	16	131	$0	$213,788
79	41	Halifax County	R	75	43	54	41	59	$ 4,901.35	24.8%	$ 11,929.25	23.7%	-	231	36	267	$0	$579,416
93	44	Henry County	R	91	50	54	28	65	$ 4,722.41	24.2%	$ 10,959.77	23.6%	-	321	56	377	$0	$574,780
2	45	Highland County	R	26	20	27	30	26	$ 1,681.68	6.2%	$ 3,547.76	6.5%	1	0	0	1	$4,834	$4,995
17	49	King and Queen Count	R	92	68	72	63	79	$ 4,415.38	17.4%	$ 11,166.29	18.7%	6	0	0	6	$5,966	$12,367
84	48	King George County	R	90	79	61	67	82	$ 6,149.20	17.6%	$ 18,733.07	19.5%	31	0	0	31	$39,696	$36,733
6	51	Lancaster County	R	50	18	9	33	47	$ 2,444.28	7.9%	$ 5,090.75	8.5%	-	25	4	29	$151,952	$20,828
61	52	Lee County	R	90	46	50	66	69	$ 4,528.35	27.0%	$ 11,755.21	27.4%	-	166	35	201	$0	$241,420
10	137	Lexington City	R	82	56	67	61	70	$ 3,179.80	20.3%	$ 13,162.95	23.7%	-	23	4	27	$79,888	$30,499
86	54	Louisa County	R	84	46	61	78	79	$ 4,873.71	17.7%	$ 13,053.36	19.1%	-	147	27	174	$109,922	$209,261
27	55	Lunenburg County	R	85	45	51	47	52	$ 3,917.77	21.1%	$ 10,535.87	21.2%	12	0	0	12	$0	$21,787
26	56	Madison County	R	57	23	36	47	78	$ 4,058.37	15.6%	$ 10,455.51	16.7%	-	68	14	82	$33,667	$115,789
54	58	Mecklenburg County	R	76	26	25	17	52	$ 3,978.89	19.1%	$ 9,628.31	19.2%	-	182	29	211	$172,362	$390,873
24	59	Middlesex County	R	87	57	68	45	64	$ 3,947.24	12.9%	$ 9,459.30	14.5%	-	28	5	33	$107,403	($11,758)
25	65	Northampton County	R	75	36	35	55	47	$ 3,755.07	16.0%	$ 8,665.27	14.7%	-	58	8	66	$79,077	$132,570
22	66	Northumberland Count	R	79	42	37	62	47	$ 3,266.20	11.0%	$ 7,059.00	12.0%	6	0	0	6	$26,330	$4,705
9	119	Norton City	R	83	31	19	50	69	$ 6,178.85	27.2%	$ 15,019.65	31.6%	6	0	0	6	$0	$9,474
39	67	Nottoway County	R	71	35	53	62	54	$ 4,353.74	22.7%	$ 12,011.38	23.6%	-	101	16	117	$0	$167,097
88	68	Orange County	R	79	58	59	68	74	$ 4,979.17	17.3%	$ 14,008.00	19.4%	-	204	38	242	$179,216	$314,352
67	69	Page County	R	58	58	71	76	82	$ 5,028.26	22.8%	$ 12,586.48	23.5%	-	149	30	179	$0	$267,242
35	70	Patrick County	R	90	23	6	30	57	$ 3,928.87	20.8%	$ 9,325.31	20.3%	-	130	25	155	$0	$205,740
106	71	Pittsylvania County	R	89	51	52	71	71	$ 4,956.89	22.9%	$ 11,911.10	23.0%	-	407	75	482	$0	$752,704
36	73	Prince Edward County	R	82	45	42	47	60	$ 3,010.48	16.9%	$ 9,116.16	17.5%	-	92	14	106	$65,899	$231,056
31	79	Richmond County	R	98	78	72	82	70	$ 5,139.78	25.8%	$ 16,283.94	26.3%	9	0	0	9	$12,256	$17,528
57	81	Rockbridge County	R	90	73	54	77	83	$ 4,131.20	15.7%	$ 10,041.87	17.2%	20	0	0	20	$30,160	$27,549
46	83	Russell County	R	67	21	27	28	46	$ 3,769.66	18.7%	$ 9,567.44	16.9%	-	183	38	221	$0	$309,074
94	85	Shenandoah County	R	89	58	75	70	67	$ 5,237.17	21.0%	$ 13,031.58	22.0%	-	241	46	287	$535,366	$438,640
74	86	Smyth County	R	85	45	48	55	58	$ 4,700.39	21.4%	$ 11,546.90	20.4%	-	211	44	255	$0	$487,597
58	87	Southampton County	R	88	70	64	69	78	$ 5,603.63	23.9%	$ 15,383.44	25.9%	-	122	21	143	$2,485	$285,861
23	90	Surry County	R	97	79	83	82	90	$ 5,606.17	22.9%	$ 14,383.25	25.8%	3	0	0	3	$24,385	$1,868
98	92	Tazewell County	R	88	72	68	74	79	$ 5,435.63	25.2%	$ 12,897.52	23.1%	-	263	54	317	$0	$594,725
33	95	Westmoreland County	R	85	61	61	56	73	$ 3,301.90	12.9%	$ 8,259.25	15.3%	11	0	0	11	$7,707	$17,409
102	96	Wise County	R	86	85	82	91	94	$ 6,414.59	32.1%	$ 16,515.80	29.0%	-	256	52	308	$0	$520,578
66	97	Wythe County	R	74	36	40	61	72	$ 4,535.19	19.5%	$ 10,997.38	19.5%	-	175	34	209	$35,161	$373,789

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